University of California

College of Agriculture

Agricultural Experiment Station

Berkeley, California

THE CALIFORNIA MUSCAT GRAPE OUTLOOK

by

G. M. Peterson and S. W. Shear

May, 1933

LIBRARY

Contribution from the

Giannini Foundation of Agricultural Economics

Mimeographed Report No. 23

Table of Contents

	Page
Reason and purpose of study	1
Raisin grape acreage and production, 1909-1932	1
Unimportance of Muscats outside of San Joaquin Valley	1
Pre-war situation	2
Post-war expansion	2
Present acreage situation	2
Yield per acre and quality of Muscats	3
Trend of raisin production	5
Pre-war California production	5
Post-war California production	5
Foreign raisin production	7
Spanish Muscat production	7
Australian and South African Muscat production	9
Farm prices of raisins	9
Factors determining normal Muscat-Thompson price differential	9
Favorable Thompson price differential, 1909-1922	9
Influence of fresh Muscat sales on differential, 1923-1928	9
Price situation since 1928	11
Position of Muscats in the raisin trade	11
Shipments of California raisins	11
Exports to foreign countries	12
Shipments for domestic consumption	12
Sales of raisins by type of pack	14
Sales in cartons and bags	15
What housewives think about Muscat raisins	15
Bulk sales of raisins	17
Cluster and layer Muscats	17
Spanish competition with clusters	18
Causes of downward trend in clusters	18
Outlook for cluster Muscats	18
Loose, stemmed, unseeded Muscats	19
Fresh Muscat outlets	20
Pre-war utilization	20
Rise of eastern demand after prohibition	20
Trend of shipments since 1919	20
Relation to wine-grape supplies, prices, and demand	22
The outlook for Muscat grapes	22
Future demand for fresh Muscats	23
Future demand for Muscat raisins	23
Probable trend of future production	24
Possibilities of increasing the demand for Muscat raisins	25

List of Figures

Page

Figure 1. Bearing acreage of California raisin and wine grapes (1919-1932) 4

Figure 2. Bearing acreage and harvested production of California Muscat grapes (1919-1932) 4

Figure 3. Production of California raisins by chief varieties, Muscat, Thompson Seedless and total (1913-1932) 6

Figure 4. Bearing acreage and total production of all California raisin grapes (1919-1932) 8

Figure 5. Raisin production in foreign countries (1920-1932) 8

Figure 6. California Muscat and Thompson Seedless raisin prices to growers (1909-1932) 10

Figure 7. Monthly f.o.b. packer quotations on California bulk seeded Muscats and bulk Thompson Seedless raisins (September, 1925 to March, 1933) 10

Figure 8. Total sales of California Muscat raisins, by kind of pack (1925-1931) 13

Figure 9. California shipments of seedless and Muscat raisins for domestic consumption and for export (1921-1931) 13

Figure 10. Sales of Muscat and seedless raisins for domestic consumption, in percentage of the 1928-1931 average (1925-1931) 16

Figure 11. Interstate shipments and estimated farm prices of California fresh Muscat and wine-grape varieties (1919-1932) 21

Digitized by the Internet Archive
in 2014

https://archive.org/details/californiamuscat23pete

List of Tables in Appendix

Table 1. California acreage and production of Muscat grapes in 1930 and fresh interstate rail shipments in 1930 and average 1928-1932.

Table 2. Acreage, production, and utilization of Muscat grapes in California, 1913-1932.

Table 3. California bearing acreage of raisin and wine-grape varieties, 1919-1932.

Table 4. California raisin production by varieties, 1913-1932.

Table 5. Raisin and currant production of chief countries, average 1909-1913, annual 1920-1932.

Table 6. Estimated harvested production and utilization of California raisin grapes, by varieties, 1919-1932.

Table 7. California Muscat and Thompson Seedless raisin prices to growers, 1909-1932.

Table 8. Monthly f.o.b. California quotations on choice bulk baker seeded Muscat and Thompson Seedless raisins.

Table 9. Domestic and export shipments of California raisins.

Table 10. United States raisin imports, average 1910-1914, 1921-1925, annual 1925-1932.

Table 11. Sales of California Muscat raisins.

Table 12. Sales of seedless raisins for domestic consumption.

Table 13. Sales of California Muscat and of seedless raisins for domestic consumption, 1925-1931 (in percentages of the 1928-1931 average).

Table 14. California Muscat grapes marketed fresh, 1925-1932.

Table 15. Interstate shipments and eastern auction and estimated farm prices of California fresh Muscats and wine-grape varieties.

THE CALIFORNIA MUSCAT GRAPE OUTLOOK

G. M. Peterson[1] and S. W. Shear[2]

Reason and Purpose of Study

Decreased consumption of California Muscat raisins in recent years, the very low farm prices for the 1932 Muscat raisin crop, and the reluctance of packers to buy them in recent months have led many in the industry to question whether Muscat grape production in California should largely be abandoned. As a result the Giannini Foundation of Agricultural Economics was asked by representatives of the industry to make a study of the economic situation of the Muscat raisin-grape industry in order to determine, in so far as possible, what the outlook for future sales might reasonably be expected to be. Such an analysis of the situation of, and outlook for the California Muscat has been made with the generous cooperation of Sun-Maid, the independent packers of the state, the Dried Fruit Association of California, and other related factors in the industry.

The results of this analysis, which are presented in this report, do not indicate that the future of the Muscat industry is hopeless, but offer considerable evidence for the belief that the domestic market still offers a sufficient demand for a limited amount of Muscat raisins and fresh Muscat grapes to justify the maintenance of much of the Muscat acreage in the state of a productive quality and capacity equal to, or above the present average.

Raisin Grape Acreage and Production, 1909-1932

Unimportance of Muscats Outside of San Joaquin Valley.-- The production of Muscat grapes in California is concentrated largely in the San Joaquin Valley, in which about 92 per cent of the total Muscat acreage of the state is located. Nearly all of the Muscats produced in the San Joaquin Valley are either dried or utilized for wine making, most of the latter being shipped to eastern markets. A few of the mid-season and late shipments of fresh Muscats are also consumed as table grapes. Although no exact data on the total quantity of Muscats used as table grapes are available, it is known that it constitutes only a small proportion of total shipments of fresh Muscats. Many of the early shipments of fresh Muscats from the southern part of the San Joaquin Valley, particularly from Kern County, and nearly all of those grown in southern California, i.e., in counties south of the Tehachapi Mountains are consumed as table grapes. Table 1 shows that an average of only 2,340 tons a year of fresh Muscats shipped from California originated in southern California in the years 1928-1932. This represents only 2.3 per cent of the total shipped fresh from the state. Only about 6 per cent of the total Muscat acreage of the state lies

---

[1] Associate Professor of Agricultural Economics, Associate Agricultural Economist in the Experiment Station and Associate Agricultural Economist on the Giannini Foundation.

[2] Associate Agricultural Economist in the Experiment Station and Associate Agricultural Economist on the Giannini Foundation.

---

south of the Tehachapi Mountains. Since shipments of fresh Muscats primarily for table purposes compete largely with other varieties of early table-grape shipments, their future production, consumption and price is tied up with the early table grape industry rather than with the future of the raisin and wine grape industries. For this reason, and also because they are such an unimportant part of the whole Muscat problem, further discussion of Muscats as fresh table grapes has been omitted from this report.

Pre-War Situation.-- The present difficulties of the Muscat grape industry of California had their origin before the War in the increasing popularity of the Thompson Seedless raisin, the acreage and production of which has expanded enormously during the last quarter of a century, particularly in California and Australia. During the years 1909-1913, raisin-grape production in California averaged about 330,000 fresh tons, of which 75 to 80 per cent were Muscats, about 15 per cent Thompson Seedless, and about 5 per cent Sultanas. The total raisin-grape acreage of the state in 1916, according to data compiled by the Sun-Maid Raisin Growers Association, was about 148,000 acres, bearing and non-bearing, of which about 70 per cent, or 103,000 acres, were Muscats (see table 2), 25 per cent Thompson Seedless, and 5 per cent Sultanas. By 1919 and 1920 the normal raisin-grape production in the state was more than double the pre-war average, amounting to about 750,000 fresh tons of which about 50 per cent were Muscats and 40 per cent Thompsons.

Post-War Expansion.-- Under the stimulus of extraordinarily high prices for raisins in 1919, 1920 and 1921 and the large premium for Thompson Seedless raisins over Muscats (see fig. 6 and table 7), a tremendous acreage of Thompson vines were planted in the state so that by 1922 Sun-Maid estimated the total raisin-grape acreage of the state had increased to about 322,000 acres. Of this total, Thompsons now constituted about 60 per cent and Muscats only about 35 per cent, or approximately 114,000 acres. Approximately 85 per cent of the Muscat acreage was in bearing but only about 50 per cent of the Thompson Seedless acreage; in other words, the Thompson acreage in the state was doubled in a period of about four years. The peak of bearing raisin-grape acreage of the state was reached in 1926 with a total estimated at 347,000 acres by the California Crop Reporting Service (see fig. 4 and table 3). The percentage by varieties was approximately the same as given for the total bearing and non-bearing acreage in 1922. At the peak of production in 1927 a normal raisin-grape crop was about 1,300,000 fresh tons of which nearly 65 per cent or 850,000 tons were Thompsons, and about 30 per cent, or 400,000 tons, Muscats.

Present Acreage Situation.-- The California Crop Reporting Service estimated the total raisin-grape acreage in the state in 1930 at 248,000 acres, practically all of which was in bearing. The acreage data available by varieties for that year, secured from a census by the Grape Control Board,[3] show that about 64 per cent of the total was in Thompson Seedless vines and 32 per cent in Muscats. Applying these percentages to the estimated total of 248,000 acres indicates about 158,000 acres in Thompsons, 79,000 acres in Muscats, and 11,000

---

[3] See Shear, S. W. California Grape Acreage, Production, Yields, and Acreage Per Farm, 1930, By Varieties, Counties, and Districts. California Agricultural Experiment Station, mimeographed statistical summary, Aug. 1932.

---

in Sultanas. Thompson Seedless acreage has probably remained about constant since 1930 but the estimates shown in table 3 and figures 1 and 2 indicate that the Muscat acreage had decreased to about 70,000 acres by 1932 and the rough estimates of the acreage pulled late in 1932 and the early part of 1933 indicate it may not be over 65,000 acres at the present time.

Yield Per Acre and Quality of Muscats.-- A factor that has probably had, and will continue to have, some influence in reducing the bearing acreage of Muscat grapes in California is the fact that there has been a tendency for the yield of many Muscat vineyards and the quality of the Muscat grape crop to decline. The production of large yields of high quality Muscat grapes, especially for cluster raisins, requires the best of natural soil and moisture conditions as well as special cultural care. In the past such yields came principally from young vineyards on rich virgin soil with an abundance of subsurface water. Many of what were at one time the best Muscat vineyards in California have deteriorated and some have been removed. The fertility of the soil in many cases has been gradually depleted and the water table has fallen so low that surface irrigation has become necessary. In general, it is not feasible to bring old Muscat vineyards back to their former yield and quality. Muscat vines do not respond readily to heavy applications of barnyard manure and commercial fertilizer and many of the older vineyards were planted without facilities for surface irrigation. Moreover the spread of diseases and nematodes in some areas has also tended to cause a decrease in the yield and quality of Muscats.

While there has probably been a progressive deterioration in the yield per acre in many Muscat vineyards, the removal of such vineyards has not been rapid enough to raise the average yield on the total bearing acreage remaining. Yields per acre vary greatly from year to year and farm to farm. In 1930, yields were exceptionally good averaging for the state about 4.8 fresh tons per acre as compared to an average of 3.6 during the four years 1929-1932. While some Muscat vineyards yield less than one ton of fresh grapes per acre, a few of the better vineyards exceed 10 tons to the acre. These good vineyards cannot be isolated as being only in a specific area or on a specific soil type.

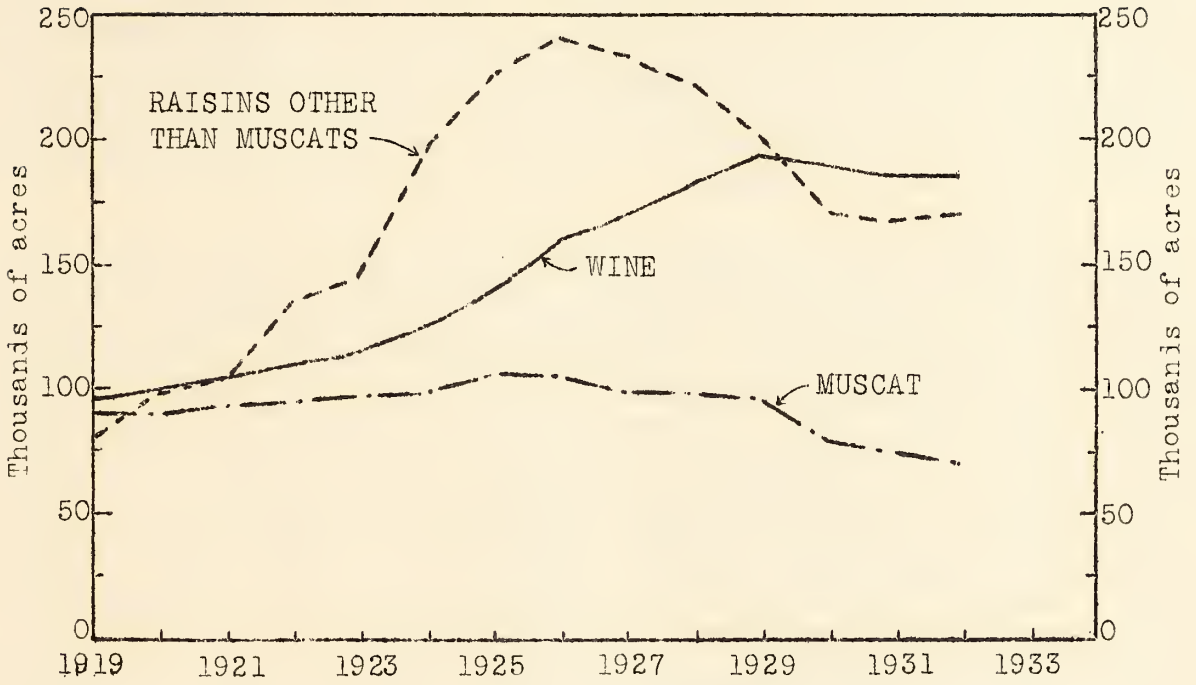
Average state yields of Muscat grapes are substantially less per acre than yields of Thompson Seedless grapes, the most serious competitor of Muscat grapes for raisin purposes. Muscat vineyards seem to require a better combination of natural conditions and cultural care to produce good yields of high quality grapes than do Thompson Seedless vineyards. Yet Muscat vines have one advantage over most other grapes in that they tend to set a second crop after a late spring frost. This advantage, however, is partly offset by the possibility that early fall rains may spoil the crop because Muscats as a rule ripen later and on account of their larger size take longer to dry than do Thompsons.4/

These cultural factors affecting the production and drying of raisins give Thompson Seedless grapes an advantage over Muscats quite apart from any difference in consumer preference for the two varieties.

4/Based on information supplied by John L. Quail, Assistant Farm Advisor, Fresno County.

FIGURE 1

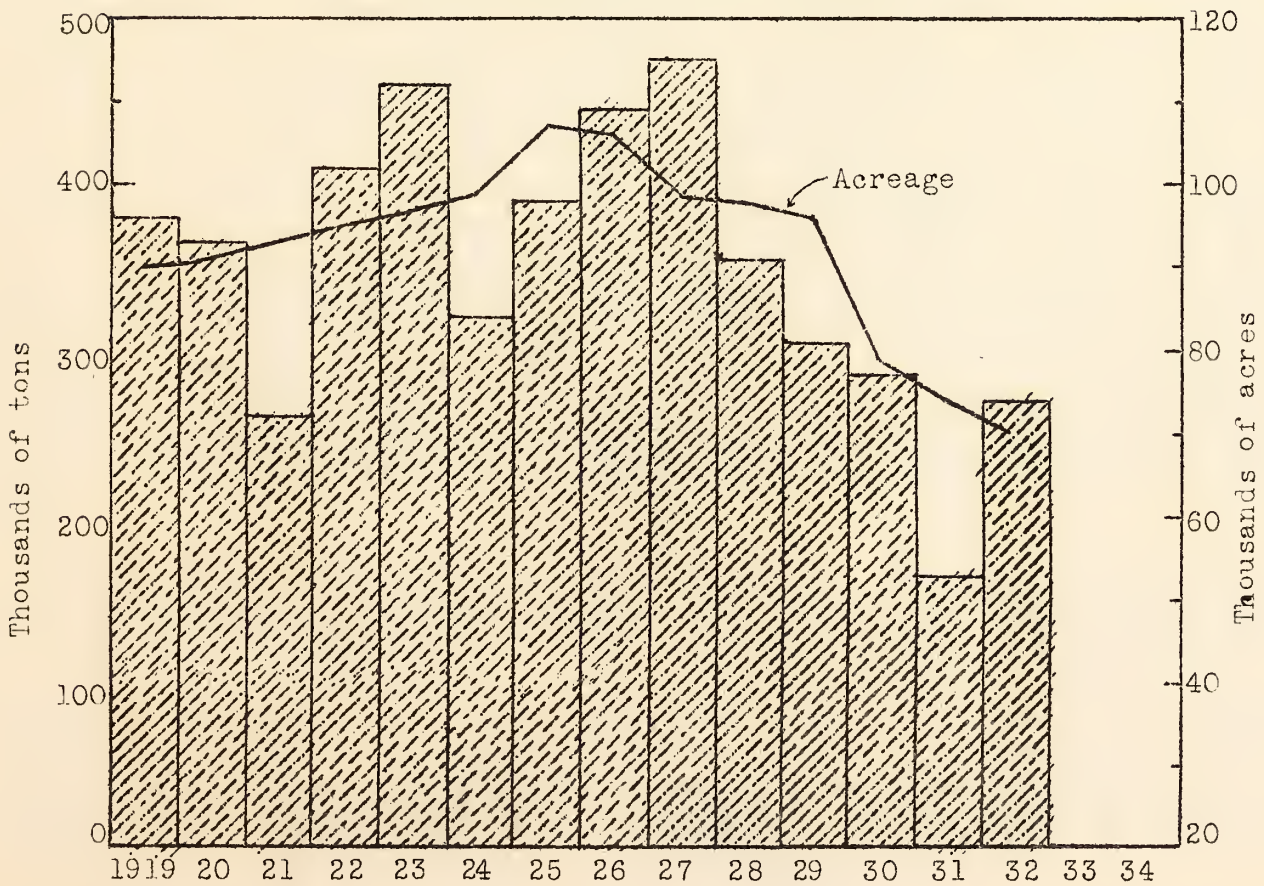
BEARING ACREAGE OF CALIFORNIA RAISIN AND WINE* GRAPES

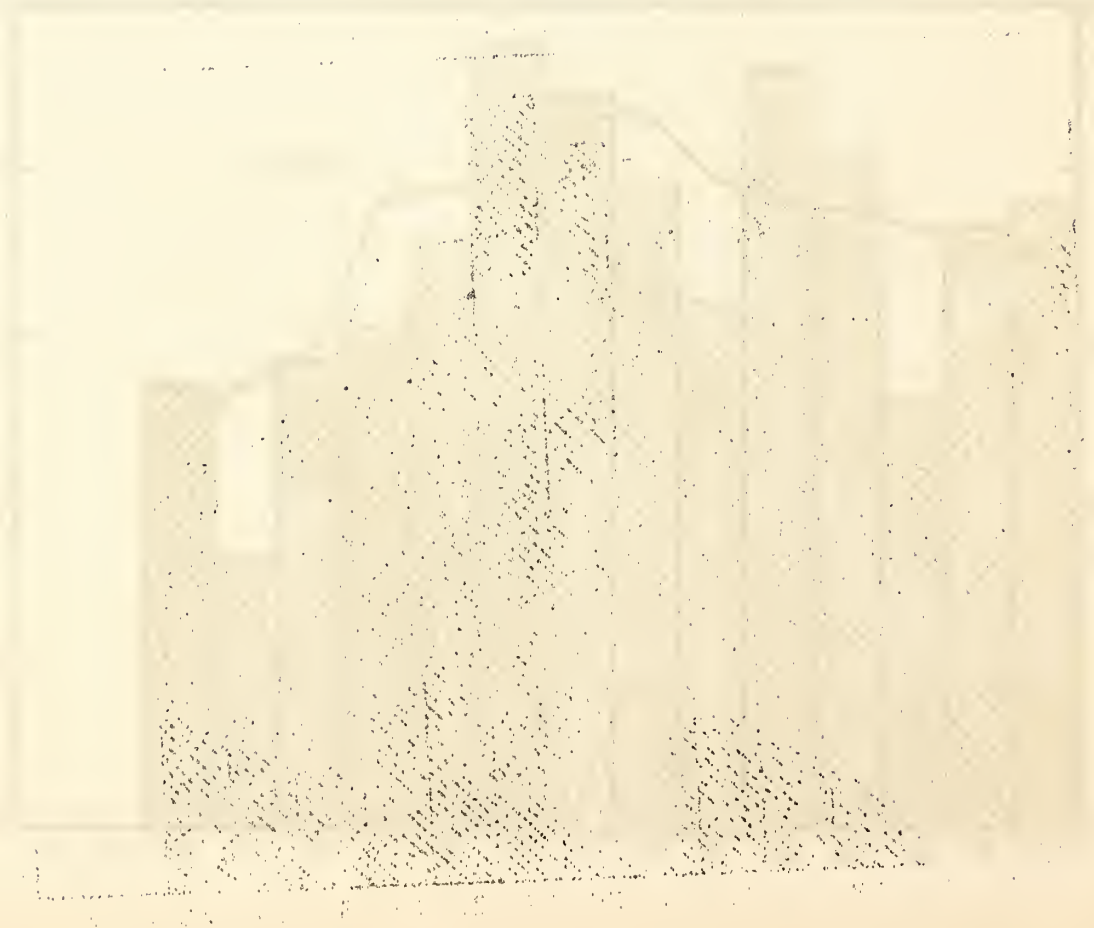


* See footnote to figure 11.

FIGURE 2

BEARING ACREAGE AND HARVESTED PRODUCTION OF CALIFORNIA MUSCAT GRAPES





Trend of Raisin Production

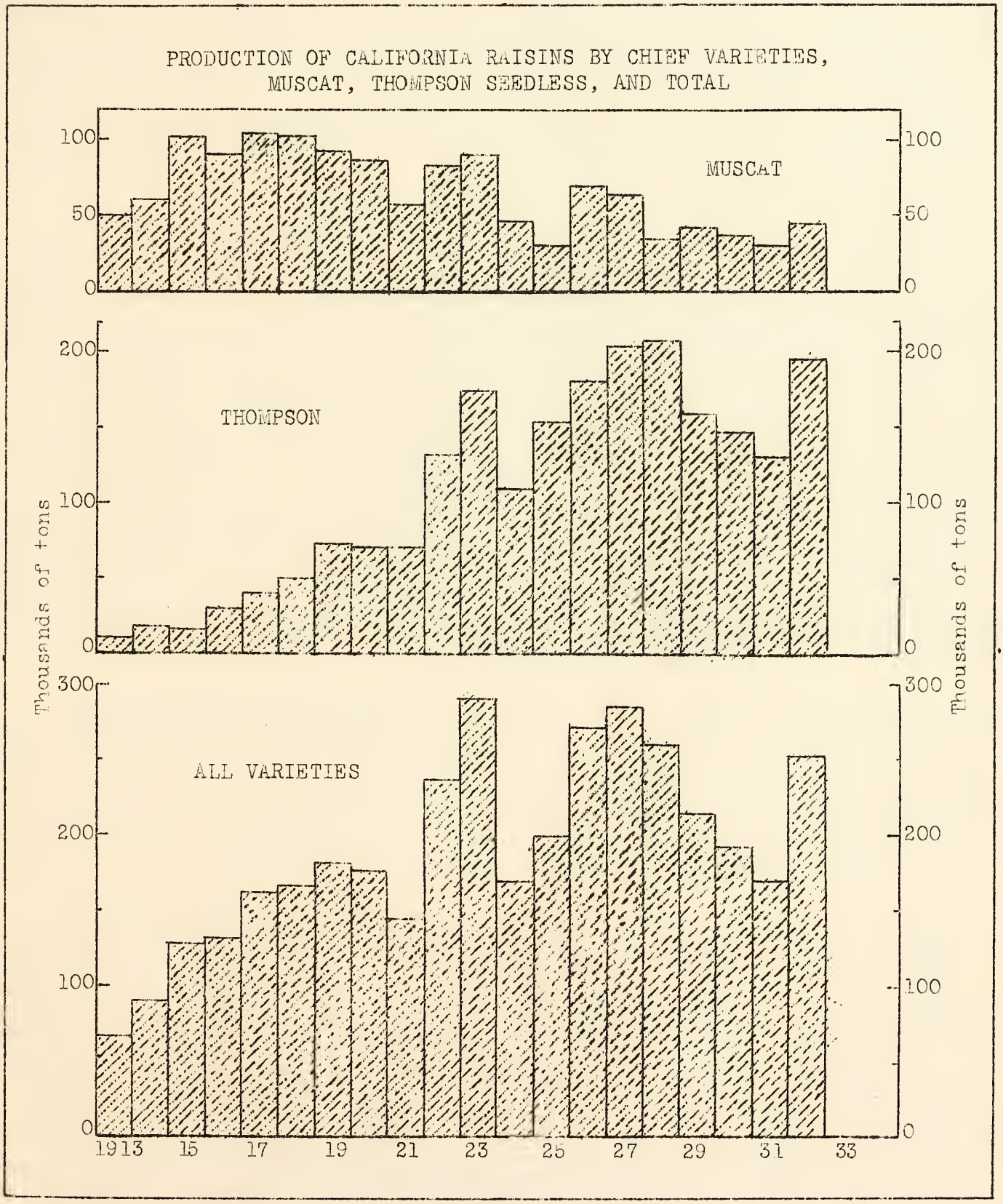
Pre-War California Production.-- Before the War practically all Thompson Seedless and Sultana grapes were made into raisins and between 85 and 90 per cent of the Muscat grapes. It is roughly estimated that only about 40,000 fresh tons of Muscats were utilized for wine and brandy making or the equivalent of only about 10,000 tons of raisins, but most of these were not of a quality to make good raisins as they were mostly culls or second-crop strippings.

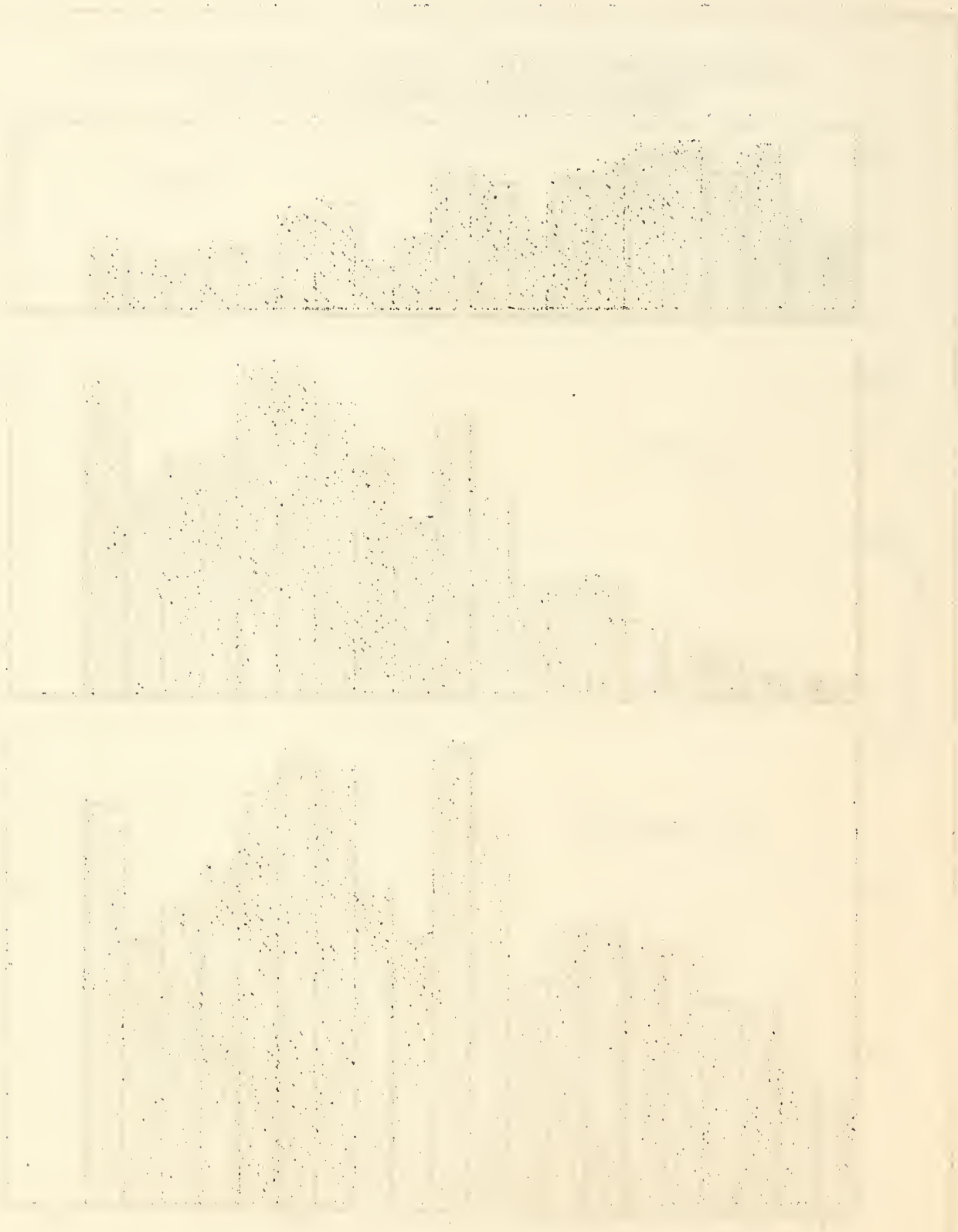
In 1913 the total raisin production of California was 66,000 tons, approximately 50,000 tons, or 75 per cent, were Muscats and only about 10,000 tons, or 14 per cent, were Thompson Seedless (see fig. 3 and table 4). Muscat raisin production increased up to 1917 when it reached a peak of 104,000 tons. After 1917, however, figure 3 shows the trend of Muscat raisin production to have been definitely downward, both absolutely and relatively, until about 1928. Up to 1922 this decline in Muscat raisin output was due almost entirely to the increase in the production and popularity of Thompson Seedless raisins. Thompson Seedless raisins were bringing growers considerably higher prices than Muscat raisins even in pre-war years (see fig. 6 and table 7) so a rapid growth in Thompson acreage and production had already started in the state. By 1919 and 1920 the total raisin production of the state had risen to 180,000 tons and the output of Thompson Seedless raisins to about 70,000 tons or nearly 40 per cent of the total. The Muscat raisin output still amounted to about 90,000 tons, but its proportion of the total was reduced to about 50 per cent.

Post-War California Production.-- As previously mentioned, the Thompson acreage of the state practically doubled from 1919 to 1923 under the stimulus of extraordinarily high prices. The full effect of this increased acreage upon production was not felt until the peak of normal raisin production in the state was reached in 1927 with an output of 285,000 tons showing an increase of over 100,000 tons in the annual raisin output of the state within a period of only ten years and at a time when at least 20 per cent of the total raisin grape crop was being utilized fresh. The 290,000 ton raisin output of 1923 was due to extraordinarily heavy yields per acre, as much of the increased post-war plantings had not yet had time to come into bearing. Of the 285,000 tons of raisins produced in 1927, approximately 204,000 tons or 72 per cent were Thompsons and only about 63,000 tons or 22 per cent were Muscats. The big increase in the proportion of Thompson raisins was the result not only of the great increase in Thompson grape production, most of which is dried, but also of the fact that a large tonnage of Muscat grapes was diverted from drying to eastern shipments as juice stock. Less than 10 per cent of the Thompson Seedless grape crop of 1927 was used fresh whereas slightly over 50 per cent of the Muscat grape crop was so utilized.

Abnormally low yields per acre coupled with the reduction in acreage resulted in a production of only 215,000 tons of raisins in 1929 and 169,000 tons in 1931. The small tonnage dried in 1930, only 192,000 tons, was due primarily to the operations of the Grape Control Board and the Raisin Pool which withheld nearly 25 per cent of the raisin-grape crop from all markets, or a tonnage equivalent to about 80,000 tons (dry weight) of raisins. The preliminary estimate of the 1932 California raisin output is 252,000 tons, the largest crop in the last four years. About 195,000 tons of these, or 77 per cent, are estimated

FIGURE 3


PRODUCTION OF CALIFORNIA RAISINS BY CHIEF VARIETIES,
MUSCAT, THOMPSON SEEDLESS, AND TOTAL
MUSCAT
THOMPSON
ALL VARIETIES
Thousands of tons
Thousands of tons
100
50
0
200
100
0
300
200
100
0
1913
15
17
19
21
23
25
27
29
31
33



by the trade as Thompson raisins and approximately 45,000, or 18 per cent, as Muscat raisins. Yields per acre, however, were little, if any, above normal in 1932, and hence it appears that the present California bearing acreage of raisin grapes, which is not over 10,000 acres less than the 1932 acreage, at normal yields per acre will still produce nearly 250,000 tons of raisins in addition to a tonnage for fresh shipments equal to the small quantities utilized in this way in 1931 and 1932. Normally such a raisin tonnage would consist of about 25 per cent Muscats, 65 per cent Thompson Seedless, and about 5 per cent Sultanas.

Foreign Raisin Production.-- Since so many California raisins compete directly with foreign raisins in export markets, it is desirable to supplement the picture of the trend of California raisin production with that in foreign countries (see fig. 5). Post-war world production of currants has been slightly less than the pre-war output (see table 5), but world raisin production increased from an average of about 225,000 tons in the years 1909-1913 to over 425,000 tons in the years 1926-1930. Expansion of California production from about 70,000 tons to about 245,000 tons accounts for most of this big increase in world production and the rapid growth of Australian production for the rest of it. From less than 7,000 tons, in pre-war years, the Australian raisin output has risen to an average of 45,000 tons in recent years. Nearly all of this increase has consisted of Thompson Seedless raisins which averaged 85 per cent of the total Australian raisin production during the last five years. Preliminary estimates indicate that the 1932 world raisin and currant output was about 600,000 tons, which appears to be only about 50,000 or 60,000 tons greater than the normal expectation from the present world acreage. These figures can only indicate that California must expect to meet continued severe competition in export markets from the large raisin and currant output of foreign countries.

Spanish Muscat Production.-- Outside of California, Muscat raisins are produced commercially in significant quantities in only three countries -- Spain, Australia, and the Union of South Africa. Average production of Muscat raisins in these three countries combined has been approximately 30,000 tons during the last five years. With the great shift in demand that has taken place the world over from seeded to seedless raisins, there appears to be little incentive for these countries to expand their production and exports of Muscat raisins.

The most important Muscat-producing country, Spain, specializes almost exclusively in the production of Muscat raisins, the average output of recent years being about 20,000 tons. Nearly 60 per cent of the Spanish exports are produced in the eastern provinces, largely in Valencia and Alicante, and are marketed mostly as loose, soda-dipped Muscats with the seeds in them. Somewhat over 40 per cent come from the Málaga District and are marketed largely as clusters and layers. There has been a marked downward trend in the production and exports of Spanish Muscat raisins during the last thirty years and figure 5 would seem to indicate that normal production may have been trending downward even since 1925. Total raisin exports from Spain during the period 1926-1930 averaged only about 18,000 tons as compared with about 28,000 tons during the years 1909-1913, and 33,000 tons in the years 1899-1904. No doubt much of the decline in Spanish Muscat raisin production and exports has been due to the increased demand for, and supply of, seedless raisins throughout the world.

FIGURE 4

BEARING ACREAGE AND TOTAL PRODUCTION
OF ALL CALIFORNIA RAISIN GRAPES

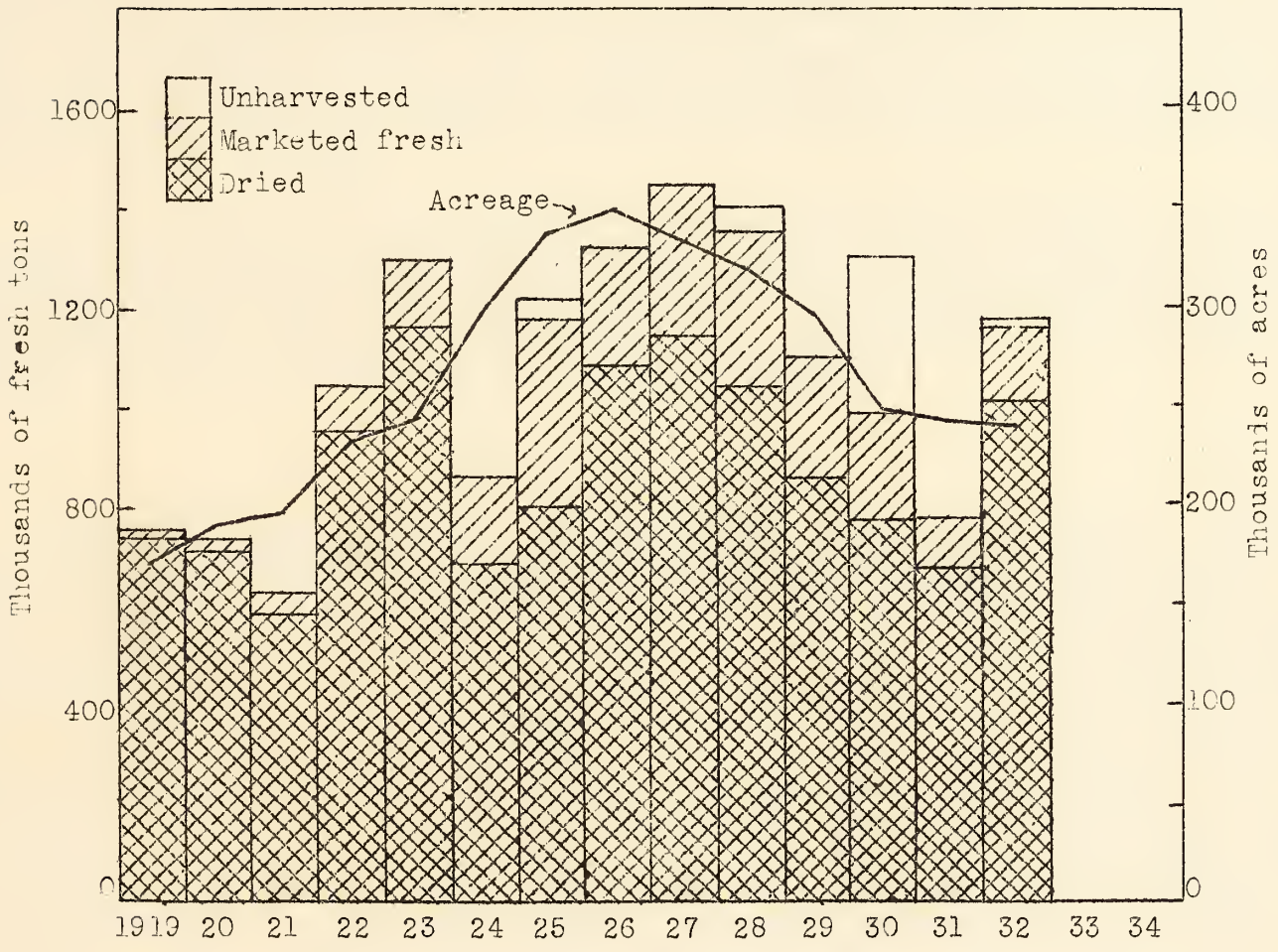
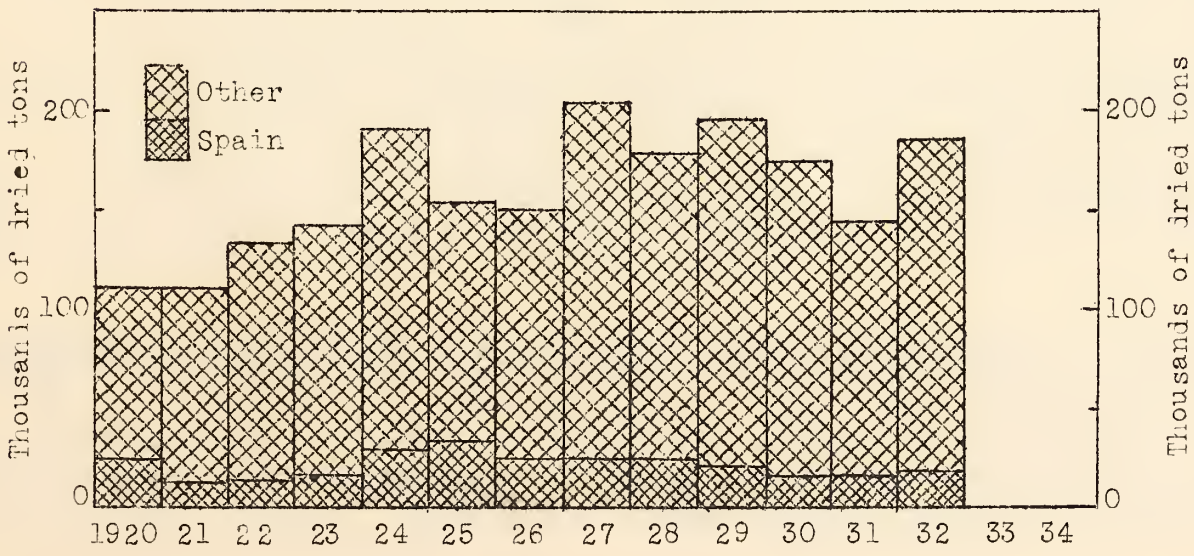
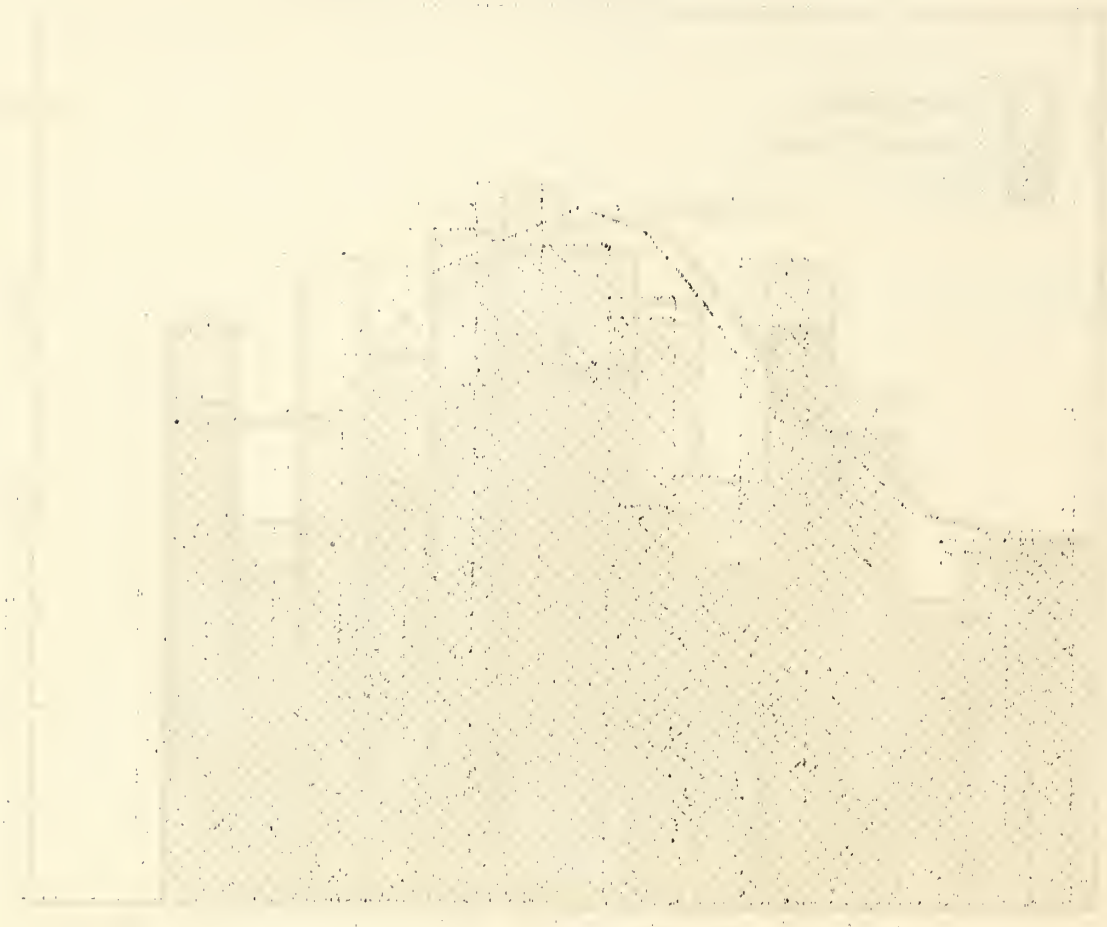


FIGURE 5

RAISIN PRODUCTION IN FOREIGN COUNTRIES





Australian and South African Muscat Production.-- Australian production of Muscat raisins has averaged about 6,800 short tons during the last five years. About 100 tons were clusters and layers and the balance lexias. The Australian lexia is the Valencia, Spain, type of Muscat raisin, soda or lye-dipped, sun dried, and generally sold unseeded. Approximately half of the lexias have been exported in recent years, between 85 and 90 per cent going to the English market and the balance to Canada.

South Africa produced an average of about 3,000 tons of Muscat raisins in the years 1928-1932 and approximately 40 per cent of these were exported. The trend of production has been slightly downward, the average of the last three years, 1931-1933, being only about 2,600 tons. South Africa's chief export market, like that of Australia, is the United Kingdom.

Farm Prices of Raisins

Factors Determining Normal Muscat-Thompson Price Differential.-- Generally, the prices received by growers for Muscat and Thompson raisins tend to reflect the prices at which packers are able to sell the two varieties and the extra cost of processing Muscats. These extra costs of handling Muscats may be roughly divided as 10 per cent more waste in processing and from about $5 to $10 greater expense in seeding and packing. The extra expense in processing will vary of course depending upon current costs of material, wage rates, the value placed on seeding equipment, and quality of product handled and packed. To illustrate, if the f.o.b. price of Muscat and Thompson raisins were equal, then at $50 per ton to growers for Thompsons, the price for Muscats would tend to be about $35 to $40, while at $40 for Thompsons the equivalent price for Muscats would be about $26 to $31, and at $80 for Thompsons the Muscats would bring about $62 to $67. If the price to growers of Thompsons and Muscats were equal, say at $50 per ton, sweat-box basis, then the f.o.b. price of packed seeded Muscats would have to be from a half to a cent a pound higher than for Thompson Seedless.

Favorable Thompson Price Differential, 1909-1922.-- The prices per ton to growers for Muscat and Thompson raisins from 1909 to 1932 are shown in figure 6. From 1909 to 1922 the price of Thompsons exceeded the price of Muscats by various amounts reaching a maximum difference of $73 per ton in 1920 when the price of all raisins reached extremely high figures. It was these high prices that stimulated the increase of plantings, especially of Thompsons, and resulted in the rapid expansion of bearing acreage a few years later as shown in figure 1. The price of Thompsons was high relative to prices of Muscats between 1915 and 1920. Part of the large premium undoubtedly was due to the fact that during these years the demand for Thompson raisins was increasing largely at the expense of Muscats which, moreover, were in plentiful supply.

Influence of Fresh Muscat Sales on Differential, 1923-1928.-- The situation from 1923 to 1928 inclusive represented a very abnormal condition. Production of Thompson raisins was increasing rapidly which tended to reduce the difference between Thompson and Muscat prices, but the most important factor was the increased demand for fresh Muscats for juice purposes and the decrease in production of Muscat raisins. In 1925 the average price to growers for Muscat

FIGURE 6

CALIFORNIA MUSCAT AND THOMPSON SEEDLESS
RAISIN PRICES TO GROWERS

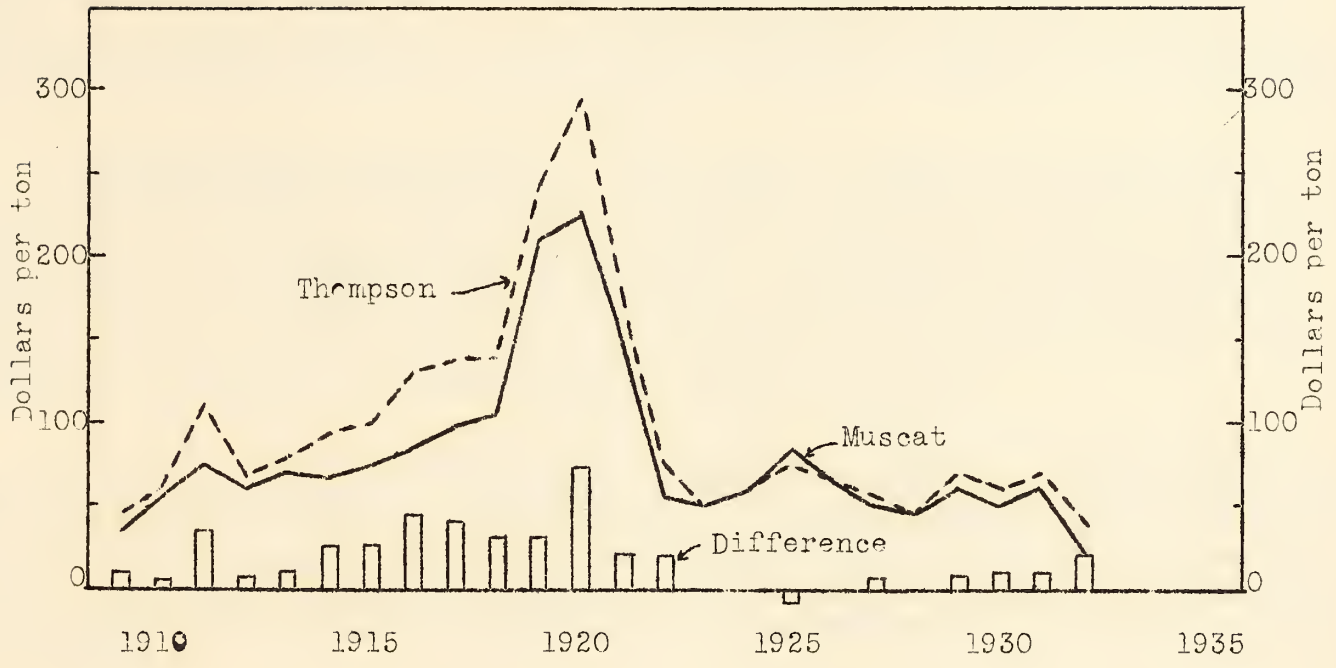
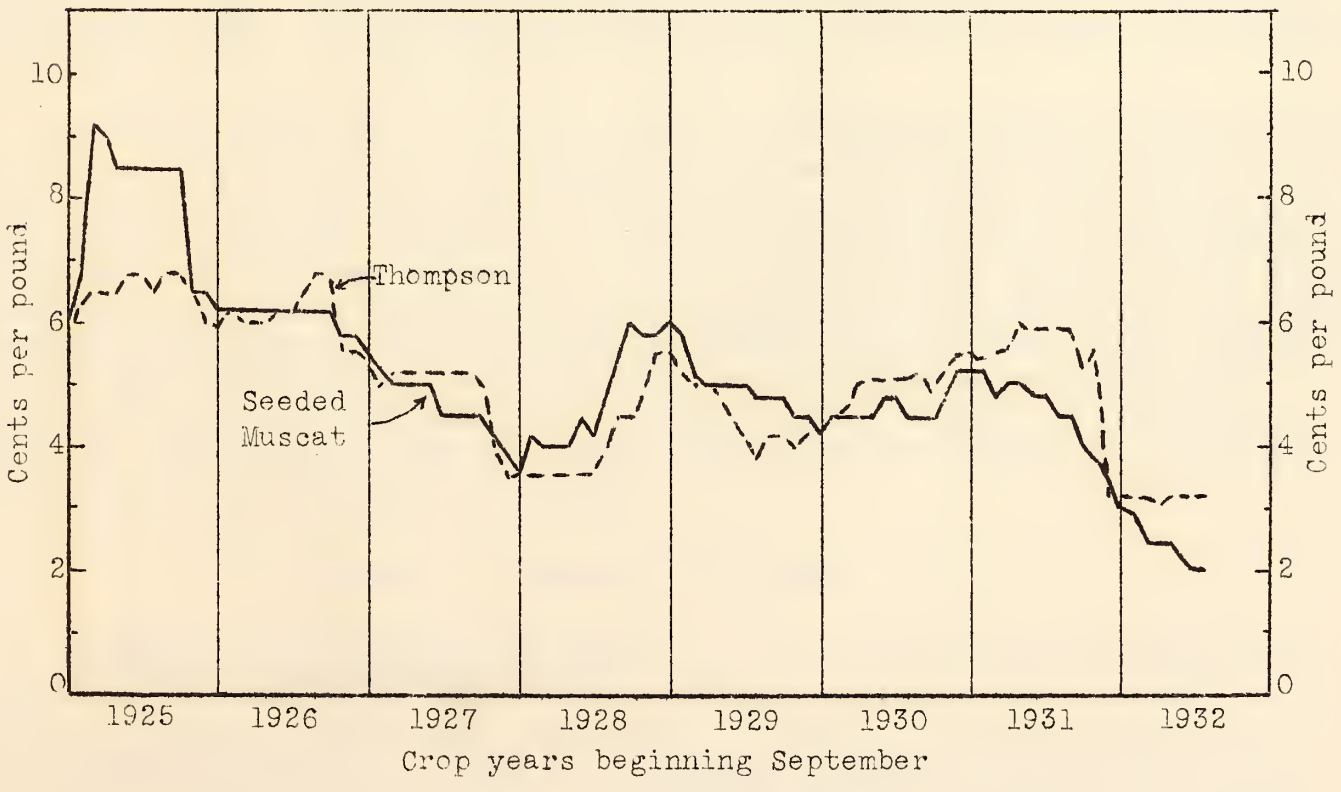


FIGURE 7

MONTHLY F.O.B. PACKER QUOTATIONS ON CALIFORNIA BULK SEEDED
MUSCATS AND BULK THOMPSON SEEDLESS RAISINS



raisins exceeded the average price of Thompsons while in 1923, 1924, 1926, and 1928, prices of the two were practically equal. Figure 7 shows that the f.o.b. quotation of Muscat raisins for the 1925 crop exceeded Thompsons by nearly 2 cents a pound while the farm price exceeded Thompsons by nearly $9 a ton. In 1928, when prices to growers for the two varieties were equal, f.o.b. quotations for Muscats averaged 3/4 of a cent higher.

Price Situation Since 1928.-- Since 1928 two important factors have affected raisin prices: first, general business conditions, and second, the raisin pool. The sharp drop in f.o.b. prices of Thompsons in August, 1932 coincides with the collapse of the raisin pool. The earlier downward trend in f.o.b. prices of Muscats indicates that the pool had not been as effective in holding up Muscat prices even though all of the 1931 pooled Muscats were still on hand as a carryover to depress prices for the 1932 crop.

The 1932 prices to growers shown in figure 6 represent average prices paid for raisins purchased to February 1, 1933. Prices for purchases made since that time have been still lower for Muscats. The very unfavorable prices for Muscats compared with Thompsons for the 1932 crop may be attributed to two main causes: the large carryover of Muscats from the 1931 crop, and the opinion of some growers and packers that Muscat raisins were being almost entirely replaced by Thompsons.

At the beginning of the 1932 crop season the raisin pool held approximately 17,000 tons of Muscat raisins and some Thompsons. The Thompsons were readily and quickly disposed of but the Muscats did not move even when they were offered at only $15 a ton, and continued as a potential source of supply to packers until the entire amount was turned over to Sun-Maid in the latter part of February, 1933. Packers would naturally prefer 1932 crop Muscats as long as they were available at approximately the same price.

With the sharp drop in f.o.b. prices of Thompson raisins in August, 1932 the f.o.b. prices of Muscats and Thompsons were nearly equal. The gradual lowering of f.o.b. Muscat prices within the past year has had very little effect on increasing the sales of Muscats, primarily because there is a considerable lag between f.o.b. prices and retail prices and most of the drop in f.o.b. prices of Muscats is only now being reflected in retail prices and hence came too late to greatly stimulate the holiday trade in November and December, 1932. The demand for Muscats is a little more seasonal than for Thompsons. Muscats for making fruit cakes, for example, are purchased mainly a month or two before Christmas. The effect of the low prices for Muscats on stimulating sales from now until next fall remains to be seen.

Position of Muscats in the Raisin Trade

Shipments of California Raisins.-- All of the California raisins produced in any one crop year have not been shipped in that year since 1920, hence changes in annual shipments are considerably different than the changes in raisin production shown in figure 3. In spite of drastic reductions in price after 1922, shipments of all California raisins failed to increase as rapidly as production and there has been a considerable carryover every year since. In

no year since 1922 has the carryover in California of sold and unsold stocks of raisins been less than 59,000 tons. As late as 1928 carryover amounted to 124,000 tons and in 1932 to about 60,000 tons.

Completed sales of raisins are shown best by data on annual shipments, which rose from about 155,000 tons, sweat-box basis, in 1921 to a peak of 290,000 tons in 1928 (see table 9). In 1929 and 1930 shipments declined to 215,000 tons and in 1931, the last completed marketing season, to about 180,000 tons.

Exports to Foreign Countries.-- Export sales to Canada and overseas markets, which are very largely seedless raisins, increased from about 30,000 tons, equivalent sweat-box weight, in the 1921 season to a peak of 119,000 tons in 1928. They fell to a little less than 67,000 tons in each of the years 1929 and 1930, and to about 61,000 tons in 1931. The export market has continuously taken fewer of both California seedless and Muscat raisins than the United States market. A much larger tonnage and percentage of seedless raisins are exported than of Muscats. In the peak years of exports the percentage of seedless raisins exported amounted to 42 per cent in 1927 and nearly 46 per cent in 1928. Since then they have averaged about 35 per cent. Exports of Muscats have been small since the War never accounting for over 20 per cent of total Muscat sales. Since 1928 they have averaged about 15 per cent.

Exports of seedless raisins increased from about 20,000 tons, equivalent sweat-box weight, annually in 1921 to about 110,000 tons in 1928 but declined precipitately in 1929 to about 60,000 tons (see fig. 9 and table 9). Exports during the next two years were at about the same figure. Since 1921 exports of Muscat raisins to Canada and overseas markets have been small, averaging less than 10,000 tons annually to 1928 and only about 5,000 tons during the years 1929 to 1931. Since exports of Muscat raisins have been small, they have had only a little effect on domestic consumption of Muscat raisins. However, changes in the volume of seedless exports may have an important bearing on domestic consumption of Muscats since an increase in seedless exports tends to lessen competition between seedless and Muscat raisins in the domestic market and vice versa.

One reason why exports of seedless raisins from California increased so rapidly from 1924 to 1928 and fell so abruptly in 1929 was the price policy in Australia which held the price of its raisins in the United Kingdom from 3 to 4 cents above the price of California raisins. This policy increased the exports of California seedless raisins while it resulted in large carryovers of Australian raisins. When this price policy was changed in the spring of 1929, exports of seedless raisins from California fell almost immediately to a lower level. Since exports have remained close to this new level during the last three years of crippled world trade, further shrinkage seems unlikely. However, with continued heavy production in foreign countries, there seems to be little reason to believe that foreign markets will again take the very large tonnages of California seedless raisins that were exported in the three years just prior to 1929. Large quantities of seedless raisins will therefore continue to be available to compete with Muscat raisins in the domestic market.

Shipments for Domestic Consumption.-- Sales of California raisins for consumption in the United States rose from about 125,000 tons in 1921 to a peak of 178,000 tons in 1927, falling to 171,000 tons in 1928 and then to only about

FIGURE 8

TOTAL SALES OF CALIFORNIA MUSCAT RAISINS, BY KIND OF PACK

Thousands of tons, sweat-box basis

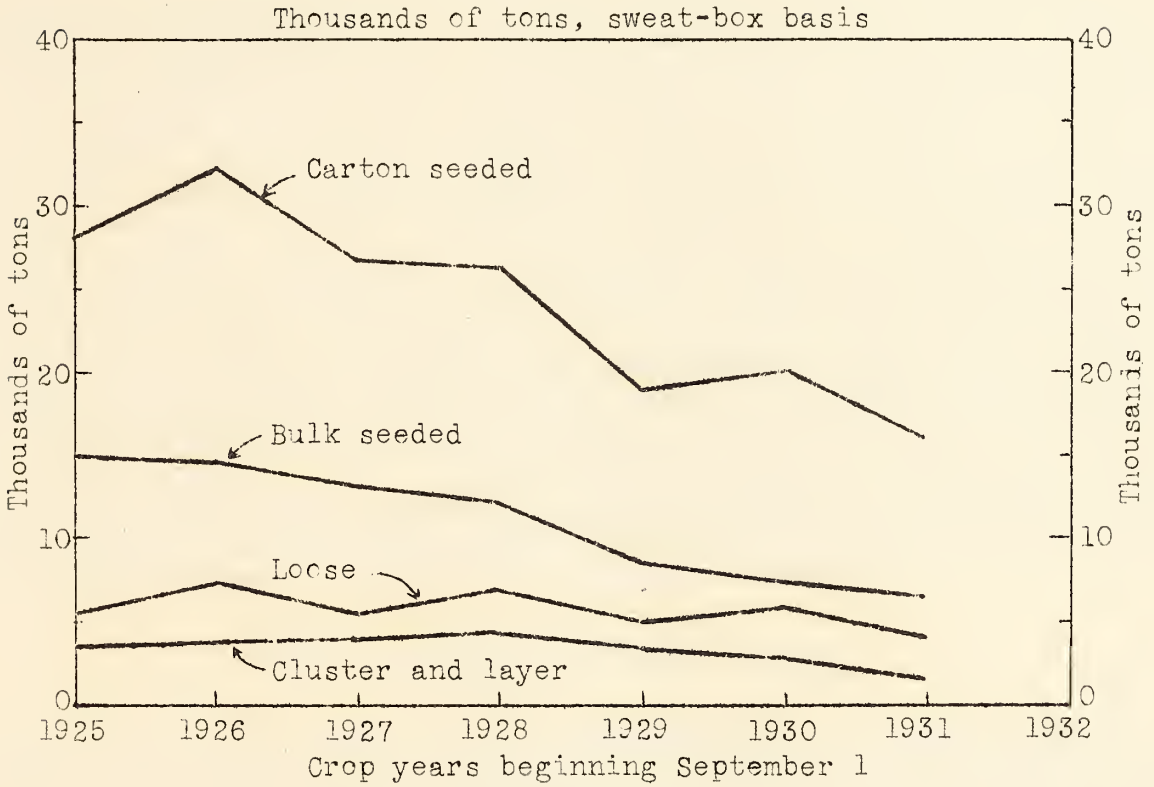
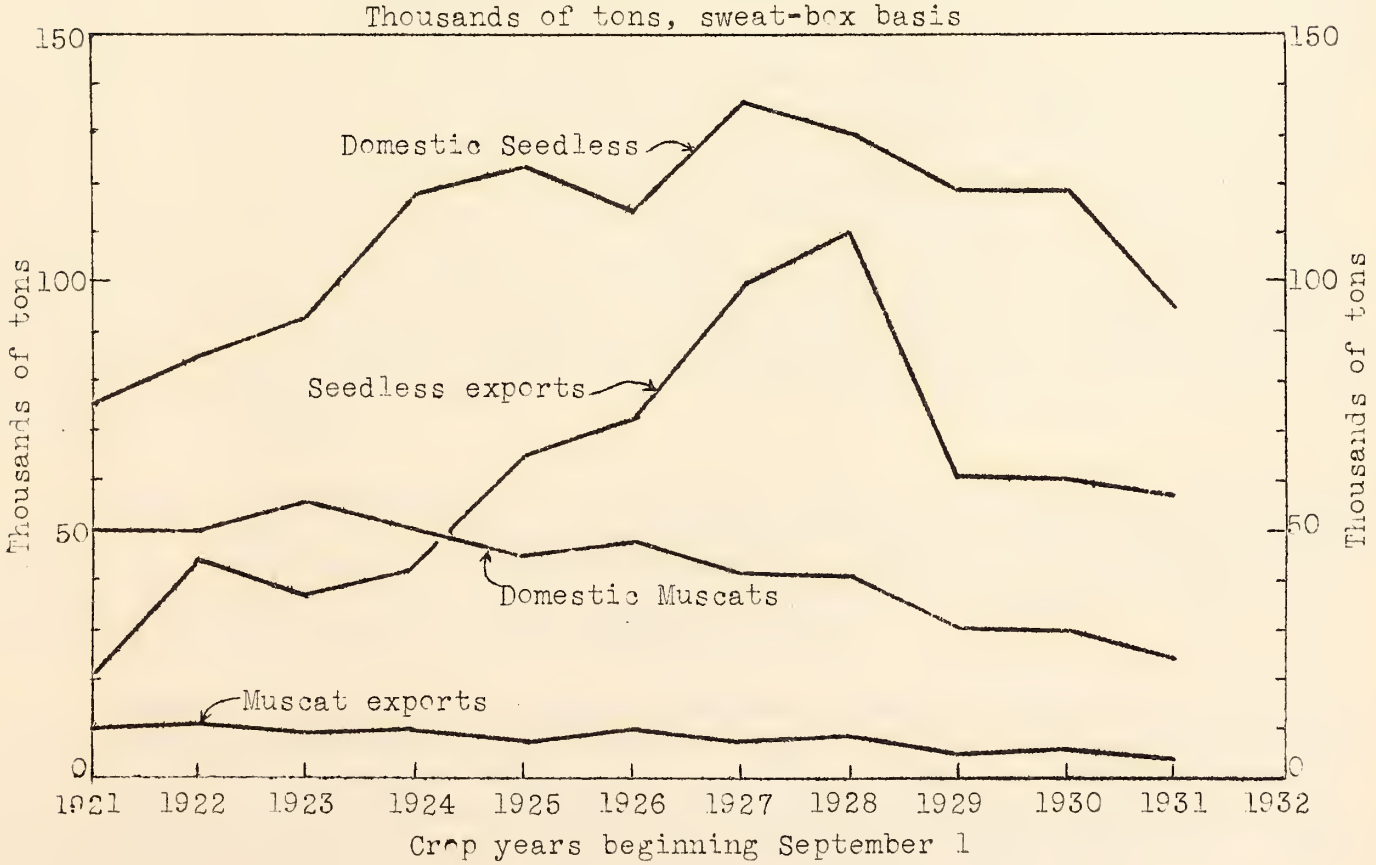


FIGURE 9

CALIFORNIA SHIPMENTS OF SEEDLESS AND MUSCAT RAISINS
FOR DOMESTIC CONSUMPTION AND FOR EXPORT

Thousands of tons, sweat-box basis



148,000 tons in 1929 and 1930, reaching the low level of only about 119,000 tons in the 1931 marketing season. Domestic shipments of seedless raisins increased fairly steadily from about 75,000 tons in 1921 to about 136,000 tons in 1927 but declined continuously thereafter until they amounted to only about 95,000 tons in 1931 (see fig. 9). Domestic shipments of Muscat raisins, on the other hand, have tended to decline gradually from the 50,000 ton level prevailing from 1920 to 1924. However, domestic consumption of all raisins was increasing up to 1927 so the decline in Muscat sales prior to 1928 was more than offset by the increase in Thompson raisin sales. Since 1927 the consumption of all raisins has declined. Practically all the decline in the 1928 domestic raisin sales was in seedless raisins. Sales of Muscat raisins from the 1929 crop declined relatively more than sales of seedless raisins, but the decline in sales of both Muscats and seedless raisins from the 1930 and 1931 crops was at an equal rate (see fig. 10). In other words, during the years 1930 and 1931 sales of Muscat raisins were suffering primarily because of the general decline in domestic demand for all raisins rather than from any further substitution of seedless raisins for Muscat raisins in the domestic market.

Sales of Raisins by Type of Pack

Muscat raisins are sold in four different ways: (1) seeded Muscats, mainly in 15 ounce cartons for the retail trade; (2) bulk seeded Muscats in 30 pound boxes for the bakery and manufacturing trade; (3) clusters and layers for special holiday trade; and (4) loose unseeded Muscats. The estimated tonnage, on a sweat-box basis, of Muscat raisins sold in each of the four types of package of market outlets from 1925 to 1931 is shown in figure 8. During the crop years 1928-1931 carton sales of seeded Muscats averaged 54 per cent of the total sales of all Muscat raisins and bulk seeded 23 per cent, while loose, unseeded Muscats amounted to only about 15 per cent and clusters and layers together only 8 per cent. The data on sales of seeded Muscats in net tons, from which the estimates of sweat-box tons were derived (see table 11), are practically complete since reports were obtained from all packers with seeding equipment. Sales of unseeded Muscats -- loose, cluster, and layer -- in net tons are for these same reporting firms only, and hence are incomplete since several other packers and dealers handle these kinds of Muscats. However, the sales of unseeded Muscats on a sweat-box basis cannot differ greatly from the estimated tonnage since they represent the difference between sales of seeded Muscats and total production adjusted for carryover.

Thompson Seedless raisins are sold in cartons and in 2 and 4 pound bags to the retail trade and in bulk to the wholesale trade for bakery and manufacturing purposes. Data were not secured on the type of pack for minor varieties of raisins, and since the total volume of these varieties is small they have been classified with bulk sales of all seedless raisins.

Competition between the different kinds of packs of Muscat and seedless raisins differs considerably depending upon the major use to which each kind of pack is put. Seeded Muscats compete with seedless raisins in both the retail and the wholesale trade but there appears to be little direct competition between unseeded Muscats (loose, cluster, and layer) and seedless raisins. About 75 per cent of total California sales of Muscat raisins are seeded.

Sales in Cartons and Bags.-- About 50 per cent of all Muscat raisins sold in recent years have been seeded and packed in cartons for the retail trade. About half of the domestic sales of Thompson Seedless raisins are also sold at retail in cartons and in 2 and 4 pound bags. In the retail trade Muscats in cartons thus compete with Thompsons in cartons and in 2 and 4 pound bags. Sales of Thompsons in cartons and bags were combined for comparison with retail sales of Muscats in the second part of figure 10. However, as the trend of sales of cartons and bags of Thompsons was quite different up to 1929, it is shown separately in the third part of figure 10. Practically no Muscats have been packed in bags in the past but in 1932 a few were packed in cellophane bags for the first time. The sale of seedless raisins in 2 and 4 pound bags started about 1923. The volume of sales increased rapidly up to 1927, remained more or less constant during the years 1928-1930 but fell off rapidly in 1931.

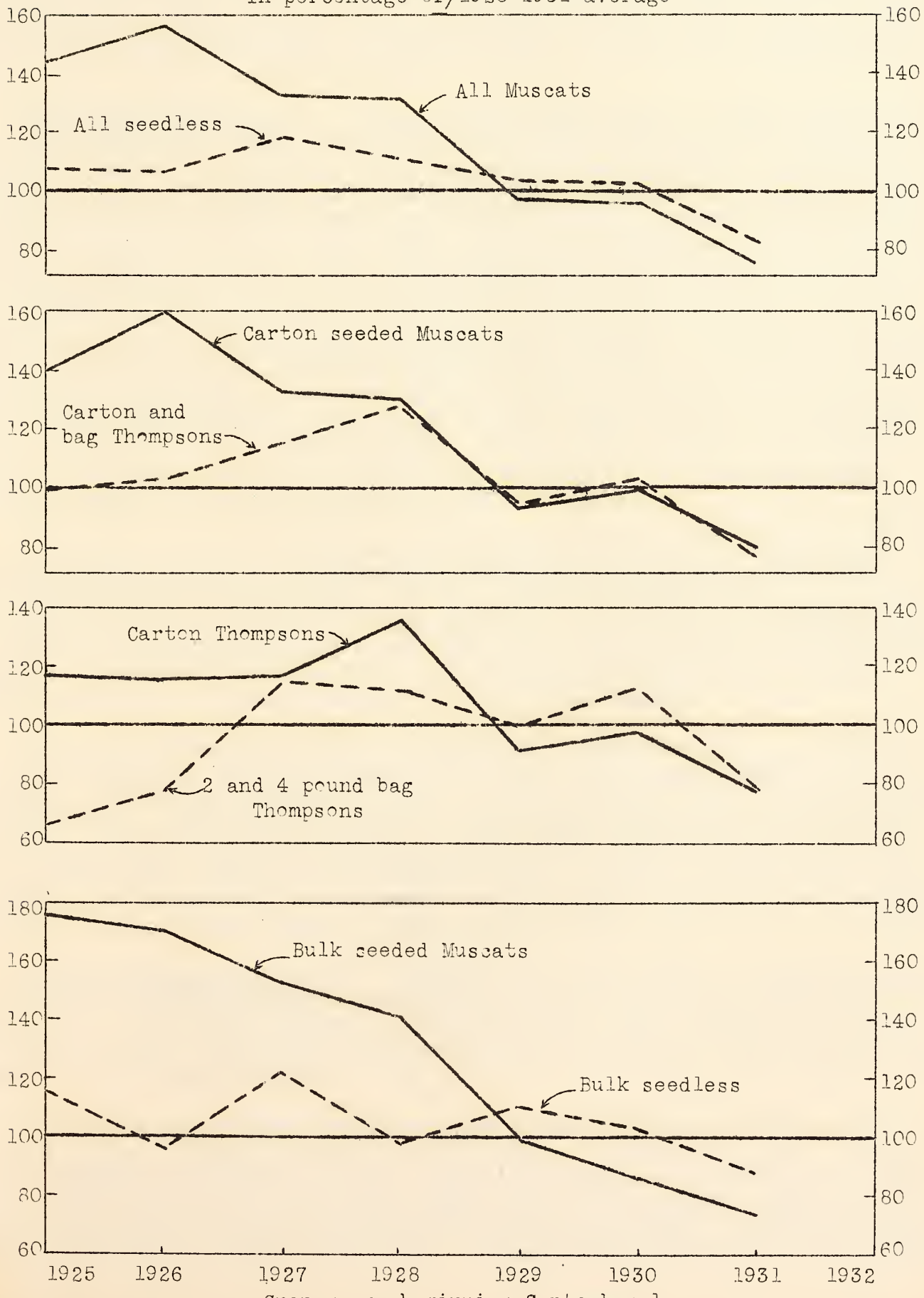
Sales of Muscat raisins in cartons apparently were larger prior to 1925, as indicated by the general trend of the line in figure 8 and curve for total domestic sales of all Muscats in figure 9. The increase in sales of carton seeded Muscats from 1925 to 1926 does not represent an increase in demand because so many Muscat grapes were shipped fresh from the 1925 crop that there were not enough Muscat raisins in 1925 to meet the demand. The f.o.b. quotations on seeded Muscats for this year exceeded the quotations on seedless raisins. They had been a little higher in 1922 but quotations on the 1925 crop averaged nearly 2 cents per pound higher and Sun-Maid had apparently completely sold out of seeded Muscats in the spring of 1926 for it ceased to quote prices on them.

From 1926 to 1927 sales of carton Muscats declined rapidly while from 1927 to 1928 they remained almost constant, whereas combined sales of Thompsons in cartons and bags increased up to 1928. Since 1928, percentage changes in sales of carton seeded Muscats and the combined sales of carton and bag Thompsons have been just about the same. However, in 1931 relative sales of Thompson raisins in 2 and 4 pound bags actually declined more than relative sales of Muscats in cartons.

What Housewives Think About Muscat Raisins.-- As over half of the Muscat raisins are packed in cartons for retail sale to housewives (fig. 8), it was considered important to learn what housewives know and think about Muscat raisins. Approximately one hundred housewives in the East Bay area, whose names were picked at random from the telephone directory, were interviewed by telephone. Although the sample was too small and the area too limited to serve as a basis for final conclusions, the results are of sufficient value to report. About one-half of the housewives purchased only Thompson Seedless raisins, one-third both Thompsons and Muscats, and about 5 per cent only Muscats, while nearly 10 per cent purchased no raisins at all. Nearly three times as many housewives as actually restricted their purchases to Muscat raisins, signified their preference for the Muscat flavor, but in most cases the objections to Muscats overcame the preference for the flavor. These objections in order of number of housewives making them were: "too sticky," "too large," "more trouble" to use than seedless raisins and "occasional seeds." The housewives who purchased both Thompsons and Muscats preferred Muscats for certain purposes, especially fruit cakes, puddings, and dark foods. While all of the housewives knew what a raisin was, roughly ten per cent were unfamiliar with Muscat raisins; some did not even know there was a seeded raisin on the market -- all they had ever seen were the

FIGURE 10

SALES OF MUSCAT & SEEDLESS RAISINS FOR DOMESTIC CONSUMPTION
In percentage of the 1928-1931 average



seedless varieties. All of the housewives were asked if they had any difficulty with raisins spoiling. Most of them replied that they never kept raisins long enough and the few who said they had had some trouble also stated that it was their own fault by keeping them in improper places. None of the housewives said anything about raisins becoming rancid.

Bulk Sales of Raisins.-- During recent years sales of seeded Muscats in bulk have accounted for about one-fourth of the total annual sale of Muscats while about half of the seedless raisins have been sold in bulk. Seeded raisins are sold in bulk to the bakery and manufacturing trade chiefly for use in fruit cakes and mince meat for which they are, to some extent, better than Thompsons, although a mixture of both is often used. Years ago large quantities of Muscats were used in bread but most of the large bakeries now use Thompsons almost entirely because Thompsons are smaller, easier to handle, do not discolor the dough, and involve less mechanical difficulty in mixing the dough. It is more difficult to obtain a well-rounded loaf containing Muscats. A few small bakeries and restaurants still use Muscats in baking a special kind of raisin bread. Even for making pies Thompsons often take the place of Muscats and all raisin pies have to compete with numerous other kinds of pies, many of which are preferred because raisin pie is so sweet. In bakery products such as buns, rolls, and cookies the Muscat is not used because it is too large. The small seedless raisins or currants are better suited for such products.

The sales of bulk seeded Muscats and bulk seedless (lower part of fig. 10) show scarcely any evidence of replacement of Muscats by seedless after 1925. Sales of bulk seedless raisins just about tended to hold their own, while all of the decrease in total sales of bulk raisins came out of the sales of bulk Muscats up to 1929 but during the last two crop years the trend in sales of both has been downward at practically the same rate. The decrease in sales of all raisins during this period is primarily due to falling off in demand.

The data available on sales from September, 1932 to January 31, 1933 for the present marketing season as compared with the corresponding period of the 1931 season indicate an increase at about an equal rate in sales of both Thompson and Muscat raisins into retail channels. Undoubtedly these sales for the complete 1932 marketing season will exceed those in 1931 and they may regain the level of 1930 sales. Sales of bulk seeded Muscats, however, do not show a similar increase but apparently tend to equal the 1931 level. Data are not available to indicate sales of bulk seedless raisins from the 1932 crop.

Cluster and Layer Muscats.-- Although the total sales of unseeded Muscats are small and clusters and layers constitute the least important outlet for Muscat raisins a detailed analysis of the cluster and layer situation has been made because a number of growers were particularly interested in the possibilities of expanding this market outlet.

Forty years ago before seeding equipment became extensively used, most California Muscat raisins were sold on the stems as clusters or layers. Older packers estimate that twenty or thirty years ago as much as 15,000 tons of California raisins were sold in this form, nearly all in the domestic market, presumably. It is believed that a considerable volume continued to sell until about the time of the War or shortly thereafter. Since 1925, however, this outlet has

been relatively unimportant as figure 8 clearly indicates. Sales of clusters and layers are estimated at about 3,300 tons in 1925. They increased a little to approximately 4,600 tons in 1928, but declined to less than 2,000 tons in 1931.

Spanish Competition With Clusters.-- There appears to be no direct competition with California layers and cluster Muscats in the domestic market except with imports from Spain. A majority of the raisins imported from Spain comes from the Málaga District and are clusters packed in fancy boxes for the retail trade. Table 10 shows that United States imports from Spain have been very small in recent years, averaging only 473 tons during the last five years. Since 1909 total raisin imports from Spain have seldom amounted to more than 1,000 tons in any year except during the period 1920-22 when they were attracted to our markets by the inordinately high prices asked for California raisins. Imports from Spain in the calendar year 1920 were 12,937 tons and for the three years 1920-1922 averaged about 6,200 tons. All of these, however, were presumably not clusters as it is known that at least a few hundred tons were exported to the United States from the Valencia-Alicante District which is said to export mostly loose Muscats.

Causes of Downward Trend in Clusters.-- The downward trend in domestic consumption of clusters and layers during the last 25 or 30 years appears to have been due to two main causes: (1) deterioration in the quality produced in the state, and (2) the decline in the domestic demand for them. The production of cluster Muscat raisins of a high quality requires vigorous vines that have been well cared for. Special pruning is necessary with removal of suckers and proper thinning of bunches during the growing season and careful picking of selected bunches at harvest time. With high wages of labor during the War most raisin growers failed to take the care of vines necessary to produce quality clusters. Partly for this reason "tray slips" were introduced. After the grapes are picked and dried on trays in the usual manner, the trays with the best looking bunches are selected and the raisins are slid off into sweat boxes instead of being dumped into them. After every few trays of raisins a layer of paper is put in the sweat box. In recent years tray slips have brought a premium of about $10 per ton while hand sorted clusters have brought about $20 per ton more than ordinary Muscat raisins. However, differentials as large as these may not prevail in the future.

The proper processing and packing of clusters and layers to avoid insect infestation requires special care in cleaning and fumigating. Some packers say that they cannot go to the expense of proper packing and successfully compete with the inferior packs put on the market. They also contend that the sale of infested raisins has hurt the demand greatly. There have also been difficulties from webs inside the bunches before packing, which cannot be removed without spoiling the cluster but which give the raisins the appearance of being infested and prevent them from passing Pure-Food inspection even though no insects are present in the packed product.

Outlook for Cluster Muscats.-- Some packers believe that a good quality cluster pack could be put on the market if there were sufficient demand for it but a few believe that most California vineyards cannot again be made to produce good quality clusters and that the demand is entirely lacking. The only way to

find out is to try. A few packers of fancy fruit apparently are having fair success with their cluster business. Although many California vineyards can no longer produce full clusters of large raisins due to the age of the vines, depletion of the soil, dropping of the water table, and diseases, it appears probable that there are enough vineyards which, with proper care, could be brought to the point of producing all the good clusters that could be marketed in the domestic market.

The relatively small imports of Spanish raisins help to substantiate the belief that the domestic demand for clusters is not large and indicate that the decreasing sales of clusters and layers in the United States in recent years may be due more to a decrease in demand than to a continued decline in the quality of the pack. Moreover, the small tonnage imported from Spain shows that domestic consumption of California clusters could be increased but little even if we were successful in replacing total imports from Spain with the California product in the United States market. Probably quality is an important factor in explaining why Spanish clusters continue to be imported into the United States in spite of an import duty of 2 cents a pound. The importance of quality is emphasized by the fact that exporters of Muscat clusters from Málaga, Spain, are said to have little difficulty in disposing of their high grade clusters, but that the competition of California and Australian raisins affects the sale of their second grades.5/

The main outlet for clusters and layers, according to statements by the packers, was in the old South. The low incomes in that area, due partly to the low price of cotton, have undoubtedly decreased the demand in that area. If incomes in that area increase, presumably there will be some increase in demand for clusters and layers unless habits of consumption are changed by that time.

Not all of the clusters and layers are sold in the South and there may be a potential market for cluster raisins in homes in other sections of the United States. However, at its best, the potential market is a very limited one, restricted almost entirely to the Christmas holiday season, hence any carryover not consumed during the holiday season is likely to be unprofitable. Perhaps fear of carryover losses upon the part of the trade and the deteriorated eating quality of carryover stock may partially account for the small sales in recent years. The very limited total demand for cluster and layer Muscats may perhaps be better appreciated if one considers the fact that if half the families in this country bought one pound each, cluster consumption in the United States would amount to only about 6,000 tons.

Loose, Stemmed, Unseeded Muscats.-- Loose, stemmed, unseeded Muscats do not appear to compete with seedless raisins. About 15 per cent of all Muscat raisins sold are loose. Little information was obtained in this survey on the uses of loose Muscats, although a few dealers were confident that since prohibition considerable quantities have been used for making alcoholic beverages. Some are exported and some are sold by retail stores, especially in foreign sec-

---

5/ L. A. Wheeler, International Trade in Dried Fruit, U. S. Dept. Com. Trade Promotion Series Bul. 44, p. 23. 1927.

tions of large cities to people who like the Muscat flavor and do not object to the seeds or are attracted by the low price. To a limited extent they compete with clusters and layers. A few loose Muscats may be purchased by food manufacturers who perhaps have their own seeding equipment, while some of the poorest go for animal feed.

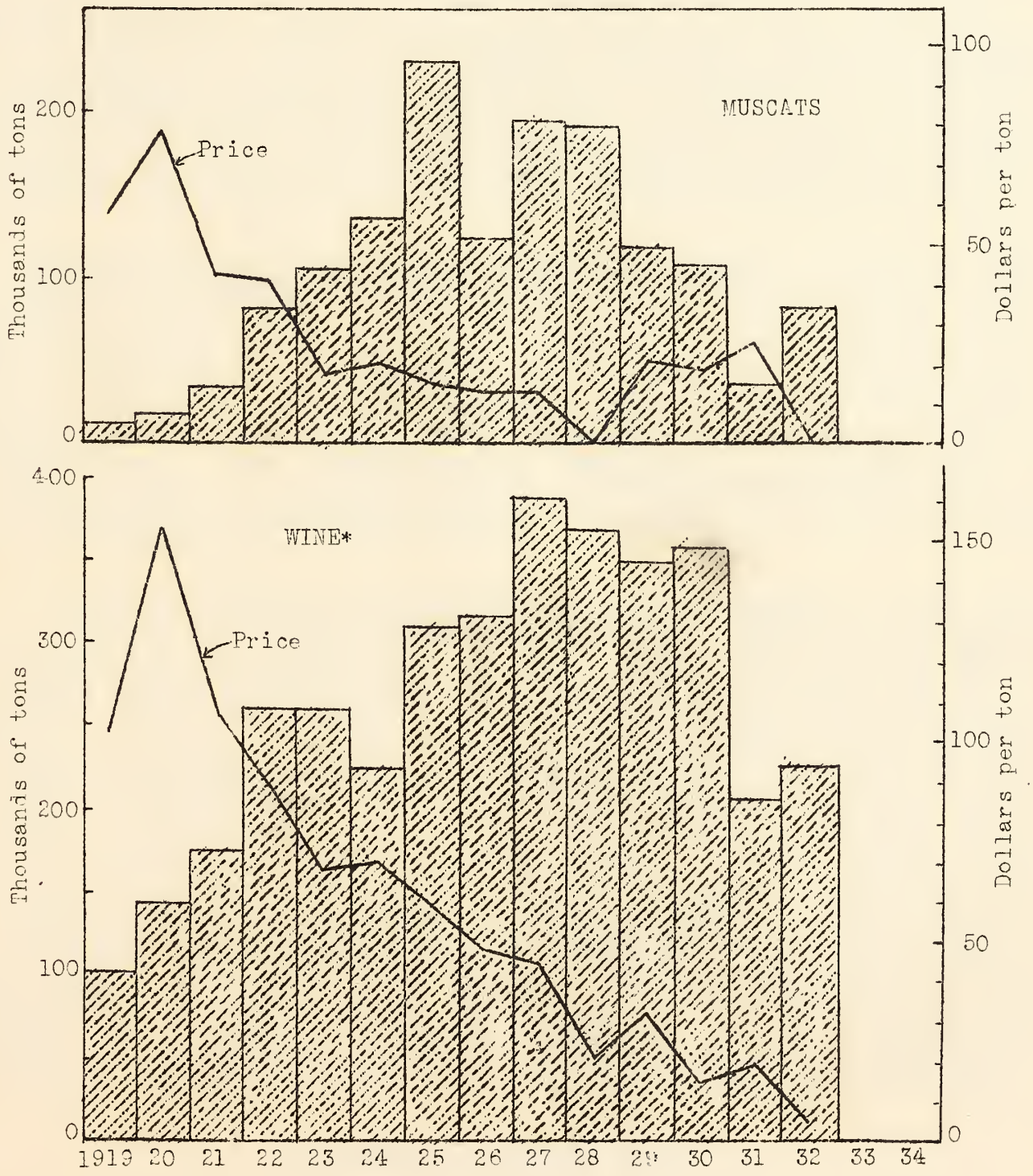
Fresh Muscat Outlets

Pre-War Utilization.-- It is estimated that before the War an average of about 40,000 tons of fresh Muscat grapes were utilized annually in California for the manufacture of wine and brandy which represented only 10 to 15 per cent of the total Muscat crop. Moreover, wineries used mostly Muscat culls or stripping of a quality too poor for raisins and largely harvested from the second setting (or crop), although the field run after the best bunches had been picked for cluster and layer raisins was sometimes purchased. The returns to growers for fresh Muscats for wine and brandy manufacture were very small, probably averaging between $5 and $7 a ton annually during the period 1909-1913.

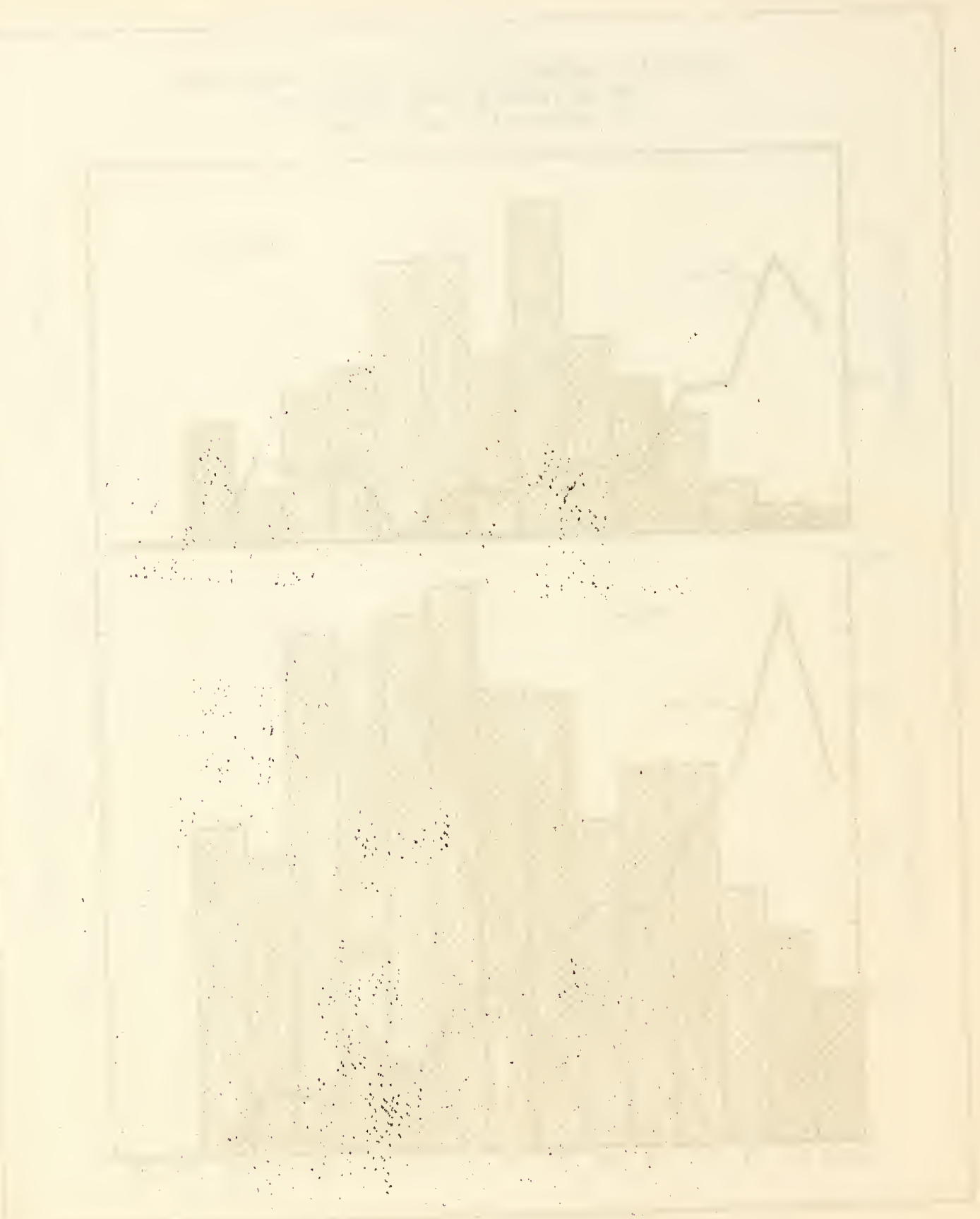
Rise of Eastern Demand After Prohibition.-- The immediate result of prohibition in 1918 was the elimination of most of the demands of commercial wineries for Muscats. However, within a few years after prohibition many people began making their own wine at home, which resulted in a rapid increase in demand for juice grapes, especially in the East. The California production of true wine-grape varieties was insufficient to supply the eastern demand for wine-making and prices of these varieties were, therefore, very high (fig. 11). The scarcity of the true wine-grape varieties resulted in an increased demand for fresh Muscats which were used largely for blending with black wine-grape varieties, partly because Muscats were lower in price, partly because their high sugar content increased the alcoholic content of wine, and partly because some persons considered that Muscats improved the flavor of wine.

Trend of Shipments Since 1919.-- The volume of California Muscats marketed fresh increased from less than 20,000 tons in 1919 to a peak of about 272,000 tons in 1925, a year of exceptionally good demand for juice grapes, and the proportion of the harvested tonnage of Muscats shipped fresh increased from about 3 per cent to 70 per cent (see table 2). The resulting decrease in the tonnage of Muscats dried improved Muscat raisin prices enough so that growers received about as much per ton for them in 1923 and 1924, and again in 1928 as they did for Thompson raisins, and in 1925 and 1926 they actually got more for Muscats than for Thompsons (see fig. 6 and table 7). Fresh Muscat sales declined to 161,000 tons in 1926, partly on account of decreased demand and lower prices for juice grapes, and partly because more grapes were dried in the hope (unfulfilled) that Muscat raisin prices would be as good as in 1925. During the next two years, however, in spite of increased shipments and lower prices of black-wine grapes, the quantity of Muscats marketed fresh rose to 226,000 tons in 1927 and 220,000 tons in 1928, utilizing 47 per cent of the harvested Muscat grape crop in 1927 and 62 per cent in 1928. With the extraordinarily good demand for juice grapes in 1927, the large shipments of Muscat grapes brought as good prices as the smaller shipments in 1926 (see fig. 11 and table 15). In 1928, however, the demand was so poor that, on the average, growers received practically nothing for fresh Muscats even though total shipments of juice grapes

FIGURE 11
INTERSTATE SHIPMENTS AND ESTIMATED FARM PRICES
OF CALIFORNIA FRESH MUSCAT AND
WINE-GRAPE VARIETIES*



* Shipments of wine-grape varieties as given exclude juice stock of table varieties and include only varieties utilized primarily for wine-making, the most important of which are Alicante Bouschet, Zinfandel, Carignane, Mataro, Mission, Petite Sirah, Malvoise, Grenache, and Burger.



were no larger than in 1927.

Since 1927 there has been a decided decline in eastern demand for and California shipments of Muscats for juice purposes as supplies of desirable black-wine grapes have been both plentiful and cheap, and eastern demand for all juice grapes has fallen off. The tonnage of the Muscat grape crop marketed fresh has decreased markedly since 1928 (see fig. 11 and table 14). The quantity marketed fresh in both 1929 and 1930 was about 140,000 tons constituting somewhat less than half of the harvested tonnage of Muscat grapes. In 1931 and 1932, however, the proportion of the harvested tonnage marketed fresh fell to about 30 per cent, amounting to 47,000 tons in 1931 and 89,000 tons in 1932.

Relation to Wine-Grape Supplies, Prices, and Demand.-- A study of what has happened to the wine-grape industry of California since the War helps one to understand why the demand for fresh Muscat grapes for juice purposes is expected to be poor in the next few years. As figure 11 shows, shipments of California wine grapes more than trebled from 1919 to 1927 while prices fell precipitously, the price decline continuing until 1932 in spite of the fact that shipments have not increased since 1927. Wine-grape prices since 1927 have suffered primarily from a downward trend in demand which first became distinctly noticeable in 1928. Since 1929, of course, the decline in demand has been greatly accentuated by the serious reduction in consumer purchasing power attendant upon the depression.

Interstate shipments of California wine grapes remained at a high level in the five years 1926-1930 averaging 355,000 tons but dropped to an average of only 216,000 tons for the years 1931 and 1932. However, the reduced tonnage of wine grapes shipped during the last two years should not be looked upon as representative of normal production from the present acreage of wine grapes in the state. Shipments in both of these years were restricted by the extremely poor demand and accompanying low prices which resulted in 10,000 tons of unharvested wine grapes in 1931 and 42,000 in 1932. Moreover, yields per acre were only 2.1 tons in 1932. Figure 1 shows that the bearing acreage of wine grapes in 1932 was still nearly as large as in 1929. At normal yields of about 2.5 tons per acre, the 185,000 bearing acres of wine grapes in California in 1932 would produce about 460,000 tons of grapes, or crops as large as the average of the years 1927-1930 when wine-grape shipments were at the peak. Such large tonnages are in excess of the amount growers can reasonably expect to sell during the next few years at prices that will return them living wages, unless commodity prices in general are greatly inflated. In the face of competition of this kind from wine grapes, prospects for selling any considerable tonnage of Muscat grapes for juice purposes, even at very low prices, appear unfavorable.

The Outlook for Muscat Grapes

Muscat prices during the next few years are dependent upon a number of factors which are difficult to predict with certainty, namely: the probable future demand for fresh Muscats for juice purposes; the probable future demand for Muscat raisins and for all raisins; the future trend in acreage and production; and the future trend of monetary and other business conditions.

Future Demand for Fresh Muscats.-- Regardless of whether or not the 18th Amendment is repealed or prohibition modified to permit sale of wines containing more than 3.2 per cent alcohol, fresh Muscats will continue to compete with wine-grape varieties, the supply of which is very large and the price of which is likely to be low. The immediate effect of repeal or modification to permit commercial manufacture and sales of wine would probably be to increase the demand for fresh Muscats for commercial wine making in the state. Moreover, it would probably not immediately reduce eastern demand for fresh shipments for household wine making as much as the demand of commercial wineries would be increased. However, as soon as wineries built up stocks of wine for aging and these stocks began to move into commercial channels, it is probable that eastern demand for juice grapes would decline about as much as commercial wines were substituted for home-made wines. Legalizing the commercial manufacture of light wines and not of sweet wines would restrict the quantity of fresh Muscats that might otherwise be used by wineries for manufacturing and for fortifying sweet wines.

The relative extent to which other beverages, especially beer, may be substituted for home-made wines is unknown. The relative costs and preference for home-made wines and the amount of internal revenue taxes levied may also have some effect on the eastern demand for Muscats and other juice grapes. Although all these uncertainties make it difficult to forecast the quantity of Muscat grapes that may be marketed fresh, it appears that there will continue to be a very limited demand for these grapes for wine making and hence the major portion of the crop will have to be marketed as raisins, unless other substantial and unexpected uses are developed or a large part of the crop is wasted. Unless demand and the general level of all prices pick up greatly as the result of the present movement toward monetary inflation, probably only 70,000 or 80,000 tons of fresh Muscats may be sold at prices that will return growers a living wage. As in the past, the quantity and the proportion of the Muscat grape crop actually marketed fresh will largely depend upon the price of fresh grapes as compared with the raisin prices being offered or anticipated at harvest time. Experience has shown that, if the price of fresh Muscats appears favorable relative to that of raisins, a larger proportion is marketed fresh. When the price of raisins is believed to be more favorable, more grapes are dried.

Future Demand for Muscat Raisins.-- In attempting to forecast future sales of seeded Muscat raisins it may be safer to be conservative than over-optimistic. However, the experience of recent years justifies the belief that a domestic market for a considerable tonnage of Muscat raisins still exists. Just how many can be sold and at what price is a difficult question to answer. All things considered, however, it seems probable that sales of seeded Muscats in cartons for the retail trade, at prices about the same as for Thompson Seedless raisins, during the next few years may again be about the same as the tonnage sold in the 1930 marketing year which was roughly 20,000 tons, equivalent sweat-box weight.6/ The sales of bulk seeded Muscats may not increase materially, but if they continue to average as much as during the depression they would provide an outlet for about 7,000 sweat-box tons.

Combined, these figures indicate future annual sales of about 27,000 tons of seeded Muscats during the next few years to which can conservatively be added

---

6/ The data on sales from September 1, 1932 to March 1, 1933 indicate that they may regain that level in 1933.

---

about 3,000 tons of loose Muscats and 3,000 tons of clusters and layers, making a total of 33,000 tons. With considerable improvement in business conditions or some special advertising stimulus to sales of Muscats, this total might be raised to about 40,000 tons which might be expected to sell at approximately the same f.o.b. prices as other raisins. Sales of 40,000 tons would still be 10,000 tons less than the amount sold in 1928, the last season before the depression started to restrict raisin sales. Rapid improvement of general economic conditions cannot be expected, although gradual improvement in business conditions during the next few years seems certain. If sales of Thompson raisins should increase above the level of the last few years, it appears just as reasonable to expect about the same rise in the sale of Muscats. Any improvement in business conditions which increases the consumption of raisins will probably have as favorable an effect on Muscats as on other raisins and perhaps more, since the acreage of Muscats has been decreasing rapidly since 1929, whereas the Thompson Seedless acreage appears to have declined little, if any, since 1930.

If the future demand for fresh juice Muscats is no greater than the average for the last three years, normal yields per acre from the present bearing acreage will produce so many Muscat raisins that they will have to sell at f.o.b. prices as low as those for Thompson raisins in order to move freely into consumption in competition with Thompsons. Higher prices will retard Muscat sales. Equal f.o.b. prices would mean growers' returns of $5 to $10 a ton less for Muscat than for Thompson raisins because of the greater loss and cost in processing and packing. Although the 1925, 1928, and 1929 marketing seasons demonstrated that some seeded Muscats could be sold at f.o.b. prices higher than for Thompson raisins (see fig. 7), it would appear that a greater reduction in Muscat acreage and production than can reasonably be expected would have to take place in California to lower the raisin output to a point at which all could be sold at a higher f.o.b. price than for Thompsons. On the other hand, experience indicates that Muscat raisin sales probably cannot be increased much relative to sales of Thompson raisins even if f.o.b. prices for Muscats are lower than for Thompson raisins, as has been the case during the last three marketing seasons.

Probable Trend of Future Production.-- Based upon the estimates already given of probable sales of Muscats as fresh grapes and as raisins, it would appear that from 200,000 to 230,000 tons of California Muscat grapes might be disposed of during the next few years at prices comparable to those for other juice and raisin grapes, which means farm prices for Muscat raisins $5 to $10 a ton less than for Thompson raisins. This estimate assumes that 70,000 to 80,000 tons may be marketed fresh, mainly for juice purposes, and 130,000 to 160,000 tons made into 33,000 to 40,000 tons of Muscat raisins. However, to attain the higher sales figure would probably require considerable improvement in business conditions and demand. Moreover, until Muscat raisin stocks are reduced sufficiently to prevent large carryovers from one crop year into the next, Muscat grape crops of even 200,000 tons will apparently be too large to dispose of at prices remunerative to growers. With prospects for a considerable carryover of 1932 Muscat raisins there appears to be little chance of growers securing better prices for the 1933 Muscat raisin crop than were received for the 1932 crop, unless the 1933 crop happens to be unusually small.

With yields of about 3.8 tons per acre, the approximate average in recent years, the estimated 65,000 bearing acres of Muscats now in the state would pro-

duce about 250,000 tons of grapes or about 50,000 tons more than the estimated quantity that might be marketed fresh and as raisins in the absence of any marked improvement in business conditions, or 20,000 tons more than probably could be marketed if business conditions improved considerably. It appears necessary, therefore, to reduce the present acreage and normal production of Muscat grapes somewhat further if growers are to have a reasonable chance of securing Muscat prices comparable to those for other juice and raisin grapes during the next few years.

Since there have been practically no recent plantings of Muscats, further reduction in bearing acreage will largely come about by the removal of old and diseased vines. In view of this fact and the probability that once carryover is eliminated there will be a market for nearly the entire normal production of Muscats in the future, no large-scale reduction in acreage is recommended. However, the normal tendency will be for Muscat raisins to bring lower farm prices than Thompsons because of the added waste and extra cost in processing Muscats.

In determining whether or not to pull his Muscat vines the individual farmer must consider this price factor as well as the probable returns from all other crops that he can produce on his soil. He must also consider the capital available and the time required to make the change. Most vine crops require at least three years before they bring any returns and tree crops at least five years. Annual crops in some cases may pay better than Muscats. Each farm represents a specific problem that cannot be solved by general recommendations. Perhaps it would be better for individual growers to abandon vineyards the yield per acre of which is well below the average yield per acre for the state as a whole. On the other hand, it is questionable whether Muscat vineyards with average yields per acre or better should be pulled.

Possibilities of Increasing the Demand for Muscat Raisins.-- Since the relative trend in the sales of Muscat raisins in recent years has been almost the same as the trend in the sales of Thompson Seedless, and both have been downward since 1927, it is evident that one might reasonably expect an increase in the demand for all raisins to help Muscats about as much as Thompsons. If domestic consumption could be restored to the 1928 level and exports kept at their present levels there would be practically no surplus raisin production from the present bearing acreage, but such a great improvement in domestic demand is hardly to be expected in the next few years.

Possible ways of extending the markets for raisins,[7] in addition to the common uses for bread and pie, include such uses as table syrup, candy, beverages, ice cream and canned raisins. These minor uses may offer some possibilities for expansion of sales by a few individual manufacturers but offer no possibility of utilizing any large tonnage of raisins. Moreover, seedless raisins can be used for most of these products about as satisfactorily as Muscats.

A little over half of both Muscat and Thompson Seedless raisins are packed for the retail trade and since it is the retail sales of carton and package goods

---

[7] Cruess, W. V., and P. F. Nichols. California Fruit News, March 25, 1933.

that have suffered the greatest decline since 1928, it would seem as though the most effective way to increase total consumption would be by stimulating retail sales.

According to the answers received from housewives interviewed, approximately 90 per cent bought raisins at retail stores. If this is generally true then no great increase in sales can result from increasing the number of people eating raisins. An increase in sales must come primarily from larger purchases by the same consumers. However, this is not as true for Muscats as for all raisins, and since the interviews indicated that less than half of the housewives bought Muscats and that some had never heard of seeded Muscat raisins, there are possibilities of increasing the consumption of Muscats partly by increasing the total consumption of all raisins and partly by having Muscats displace Thompsons.

The possibilities of increasing the sales of bulk seeded Muscats to the bakery trade by recapturing some of the uses from seedless raisins do not seem very great. On the other hand, it appears as though seedless raisins have already replaced the Muscat to such an extent for uses in bakery products that future sales of Muscats for such purposes will suffer very little, if any, from increased competition with seedless raisins as long as prices to the trade are nearly equal. Indirectly, Muscat sales might be helped somewhat by diverting more Thompson Seedless raisins into bakery channels by increasing the percentage of raisins used in raisin bread. Many bakeries now use less than 12 per cent of raisins in their bread, whereas as much as 40 per cent is used to make the best raisin bread.

Research at the University has shown that moderate amounts of raisins in the diet fully counteract the dietary "acidosis" condition of persons on a strong acid diet, and that the raisins secured in several slices of good raisin bread counteracted milk acidosis and maintained normal body reactions.[8] This healthful property of raisins might be given wider publicity, and, if combined with a campaign to get housewives to keep a bowl of raisins on the table where the family, especially the children, could have free access to them at all times, would tend to increase the total consumption of raisins. Many persons would eat raisins at any time of the day if they were set before them. For consumption in this manner the Muscat may be preferred by many over Thompson raisins because of its size and flavor.

---

[8] Saywell, L. G. The effect of grapes and grape products on urinary acidity. Journal of Nutrition, Vol. 5 (2): 103-120. 1932.

The effect of figs and small amount of raisins on urinary acidity. Journal of Nutrition, Vol. 5 (5): 519-529. 1932.

APPENDIX

Table 1

California Acreage and Production of Muscat Grapes in 1930 and Fresh Interstate Rail Shipments in 1930 and Average 1928-1932

District and county	Acreage		Yield per acre	Production	Interstate rail fresh shipments	
					1930	Average 1928-1932
	1	2	3	4	5	6
	acres	per cent	fresh tons	fresh tons	fresh tons	fresh tons
State total	78,191	100.0	4.8	376,931	106,899	102,063
San Joaquin Valley	72,068	92.2	5.0	362,037	103,454	99,437
Southern California	4,841	6.2	2.4	11,751	2,873	2,340
Sacramento Valley	755	0.9	2.2	1,683	455	169
North Coast	195	0.3	1.7	330	117	117
San Joaquin Valley	72,068	92.2	5.0	362,037	103,454	99,437
Fresno	50,392	64.5	5.2	260,906	68,562	66,859
Kings	10,219	13.1	4.3	43,677	21,710	22,217
Tulare	7,239	9.3	5.5	40,048	8,749	7,371
Madera	1,770	2.2	3.7	6,635	1,924	1,339
Merced	159	0.2	4.3	683	130	130
Stanislaus	254	0.3	5.5	1,403	1,274	663
San Joaquin*	75	0.1	3.0	225	221	247
Kern	1,026	1.3	3.8	3,948	884	611
Southern California	4,841	6.2	2.4	11,751	2,873	2,340
San Bernardino	2,943	3.8	1.6	4,613	1,534	1,560
San Diego*	1,400	1.8	4.0	5,600	1,300	741
Other Southern California	498	0.6	3.1	1,538	39	39

* Asterisk indicates counties for which best estimates available were used for acreage, yield, and production because no data were secured in the Grape Control Board's Census.

Sources of data:

Cols. 1, 2, 3, and 4: From S. W. Shear. California Grape Acreage, Production, Yields, and Acreage per Farm, 1930, by Varieties, Counties, and Districts, a statistical summary, based upon data from a survey by the California Grape Control Board, California Agr. Exp. Sta. mimeographed Aug. 1932, p. 4.

Cols. 5 and 6: U. S. Dept. Agr. Bur. Agr. Econ., Calif. State Dept. Agr., Calif. Grape Control Board Ltd., Cooperating, annual mimeographed summaries on the Interstate Movement of California Grapes, prepared by W. F. Cox. Cars converted to tons at 13 tons per car.

Table 2

Acreage, Production, and Utilization of Muscat Grapes in California, 1913-1932

Crop year	Acreage		Yield per bearing acre	Harvested production (fresh weight)	Utilization (fresh weight)			
					Tonnage		Percentage of harvested production	
	Total	Bearing			Dried ‡/	Marketed fresh	Dried	Marketed fresh
	1	2	3	4	5	6	7	8
	thousands of acres		fresh tons	thousands of tons			per cent	
1913	--	--	--	--	197	--	--	--
1914	--	--	--	--	240	--	--	--
1915	--	--	--	--	409	--	--	--
1916	103	--	--	--	356	--	--	--
1917	103	--	--	--	416	--	--	--
1918	105	--	--	--	410	--	--	--
1919	103	--	--	380	367	13	97	3 §/
1920	106	--	--	365	346	19	95	5 §/
1921	110	93	2.8	260	227	33	87	13 §/
1922	114	95	4.3	408	328	80	80	20 §/
1923	--	97	4.7	460	357	103	78	22 §/
1924	--	99	3.2	320	185	135	58	42 §/
1925	--	107	--	301 ‡/	119	272	30	70
1926	--	106	4.2	446	285	161	64	36
1927	--	99	4.8	477	251	226	53	47
1928	--	98	--	356 ‡/	136	220	38	62
1929	--	96	3.2	306	170	136	56	44
1930	--	79	4.8	287 ‡/	145	142	50	50
1931	--	74	2.2	166	119	47	72	28
1932*	--	70*	4.1*	269 ‡/	180*	89*	67*	33*
1933								

-- Dashes indicate items for which no data are available.

* Data for 1932 are preliminary and subject to revision.

‡/ Estimates of total production of Muscats in 1925, 1928, 1930, and 1932 are difficult to make because an unknown tonnage was unharvested in these years. The annual reports of the California Crop Reporting Service estimate unharvested production of all raisin grapes combined as 38,000 tons in 1925, 60,000 tons in 1928, 319,000 in 1930, and 21,000 in 1932. No estimates of the proportion of these that were Muscats are available for 1925 and 1928, but data of the Grape Control Board show that of the 316,200 tons of the 1930 unharvested raisin-grape tonnage purchased by it, 108,000 tons were Muscat grapes. Probably 90 per cent or more of the 21,000 tons unharvested in 1932 were Muscats.

‡/ Fresh weight converted from dry weight at a ratio of 4 to 1.

§/ Tonnages marketed fresh 1919-1924 may be slightly incomplete. Estimates of fresh shipments for these years are not as accurate as in more recent years.

(Table 2 continued)

Sources of data:

Col. 1: From surveys and estimates by the Sun-Maid Raisin Growers Association and its predecessor, the Associated Raisin Growers.

Col. 2: Data from C. E. Byde, The Muscat as a Raisin Grape, California Grower 4 (8): 20. Aug. 1932. Presumably the data are based upon data compiled by Sun-Maid and for 1930 upon the census made by the California Grape Control Board. The 1932 figure is a very rough estimate.

Col. 3: Items in col. 4 divided by items for corresponding years in col. 2 except for 1930 which is from table 1, and 1932, for which see footnote †.

Col. 4: Sum of items for corresponding years in cols. 5 and 6.

Col. 5: Calculated by applying the percentage of known Muscat raisin receipts of total known raisin receipts to estimates of the state total raisin crop. Years 1913-1918 from Associated Grower 5 (1): 16. Jan. 1923; 1919 and 1920 computed from data from same source. Presumably data for 1913-1920 estimated largely on basis of Associated Raisin Growers' receipts by varieties. Years 1921-1929 estimated by S. W. Shear on basis of receipts by variety as reported by Sun-Maid and most of the important independent packers. (See S. W. Shear and R. M. Howe. Factors Affecting California Raisin Sales and Prices, 1922-1929. Hilgardia 6: table 2, p. 75. Sept. 1931.) Years 1930 and 1931 based largely upon data compiled by the California Grape Control Board and the Raisin Pool. Data for 1932 are based upon current trade estimates and subject to revision.

Col. 6: Estimated from the total tonnage of raisin grapes reported as marketed fresh by applying the percentage that interstate shipments of fresh Muscats was of the total shipments of fresh Muscats and fresh Thompson Seedless grapes, except that data for 1930 and 1931 were estimated by E. W. Stillwell, formerly with the Grape Control Board.

Cols. 7 and 8: Percentage of harvested production shown in col. 4.

Table 3

California Bearing Acreage of Raisin and Wine-Grape Varieties
1919-1932

Year	Raisin varieties			Wine varieties
	Total	Muscat	Other	
	1	2	3	4
	thousands of acres	thousands of acres	thousands of acres	thousands of acres
1919	170	90	80	97
1920	189	91	98	100
1921	197	93	104	105
1922	232	95	137	110
1923	242	97	145	115
1924	297	99	198	124
1925	335	107	228	140
1926	347	106	241	159
1927	334	99	235	169
1928	320	98	222	183
1929	297	96	201	194
1930	248	79	169	191
1931	243	74	169	187
1932	239	70*	169	185

* Rough preliminary estimate.

Sources of data:

Cols. 1 and 4: Compiled from reports of the California Cooperative Crop Reporting Service.

Col. 2: From table 2.

Col. 3: Total acreage in col. 1 minus Muscat acreage for corresponding year in col. 2. The acreage of raisin grapes other than Muscats calculated by this method is only approximate since the data in cols. 1 and 2 are from different sources which may not be strictly comparable. However, this is the only series of estimates of the acreage of raisin grapes other than Muscats available for this period of years and it is believed that they show reasonably well the approximate trend of the bearing acreage of seedless raisin grapes in California.

Table 4

California Raisin Production by Varieties, 1913-1932

Year harvested	Output in dried tons					Per cent of total output			
	Total	Thompson	Muscat	Sultana	Others	Thompson	Muscat	Sultana	Others
	1	2	3	4	5	6	7	8	9
	tons	tons	tons	tons	tons	per cent	per cent	per cent	per cent
1913	66,000	9,200	49,300	6,100	1,400	13.9	74.8	9.2	2.1
1914	91,000	18,000	60,000	9,000	4,000	19.8	65.9	9.9	4.4
1915	128,000	16,300	102,300	7,300	2,100	12.7	80.0	5.7	1.6
1916	132,000	30,500	89,000	7,000	5,500	23.1	67.4	5.3	4.2
1917	163,000	40,500	104,000	10,500	8,000	24.8	63.9	6.4	4.9
1918	167,000	48,800	102,500	11,700	4,000	29.2	61.4	7.0	2.4
1919	182,500	72,000	91,750	11,750	7,000	39.4	50.3	6.4	3.9
1920	177,000	69,500	86,500	12,750	8,250	39.2	48.9	7.2	4.7
1921	145,000	71,250	56,750	12,750	4,250	49.2	39.1	8.8	2.9
1922	237,000	131,500	82,000	17,250	6,250	55.5	34.6	7.3	2.6
1923	290,000	174,500	89,250	21,750	4,500	60.2	30.8	7.5	1.5
1924	170,000	108,750	46,250	11,500	3,500	63.9	27.2	6.8	2.1
1925	200,000	153,750	29,750	13,000	3,500	76.9	14.9	6.5	1.7
1926	272,000	180,250	71,250	15,250	5,250	66.3	26.2	5.6	1.9
1927	285,000	203,500	62,750	14,750	4,000	71.4	22.0	5.2	1.4
1928	261,000	207,250	34,000	14,000	5,750	79.4	13.0	5.4	2.2
1929	215,000	159,250	42,500	9,500	3,750	74.1	19.8	4.4	1.7
1930	191,700	146,500	36,250	8,000	1,000	76.4	18.9	4.2	0.5
1931	169,000	129,500	29,750	9,750*	*	76.6	17.6	5.8*	*
1932†	252,000	195,000	45,000	12,000*	*	77.4	17.8	4.8*	*

* For the years 1931 and 1932, data on Sultanas include small but unknown quantities of raisins other than the Thompson Seedless, Muscat, or Sultana varieties.

† Data for 1932 are preliminary and subject to revision.

Sources of data:

Col. 1: Years 1913-1918 from Associated Grower 5 (1): 16, Jan. 1923. Years 1919-1932 from annual Reports of the California Crop Reporting Service.

Cols. 2 to 5: Calculated by applying the percentages of known raisin receipts by varieties to estimates of the state total raisin crop. Years 1913-1918 from Associated Grower Vol. 5 (1): 16, Jan. 1923. 1919 and 1920 computed from data from same source. Data for 1913-1920 presumably originally estimated largely on basis of Associated Raisin Growers receipts by varieties. Years 1921-1929 estimated by S. W. Shear on basis of receipts by variety as reported by Sun-Maid and most of the independent packers. (See Shear, S. W., and R. M. Howe, Factors Affecting California Raisin Sales and Prices, 1922-1929. Hilgardia Vol. 6: table 2, p. 75, Sept. 1931). Years 1930 and 1931 based largely upon data compiled by the California Grape Control Board and the Raisin Pool. Data for 1932 based upon current trade estimates.

Cols. 6, 7, 8, and 9: Percentage that items in cols. 2, 3, 4, and 5 are respectively of data for corresponding years in col. 1 as 100.

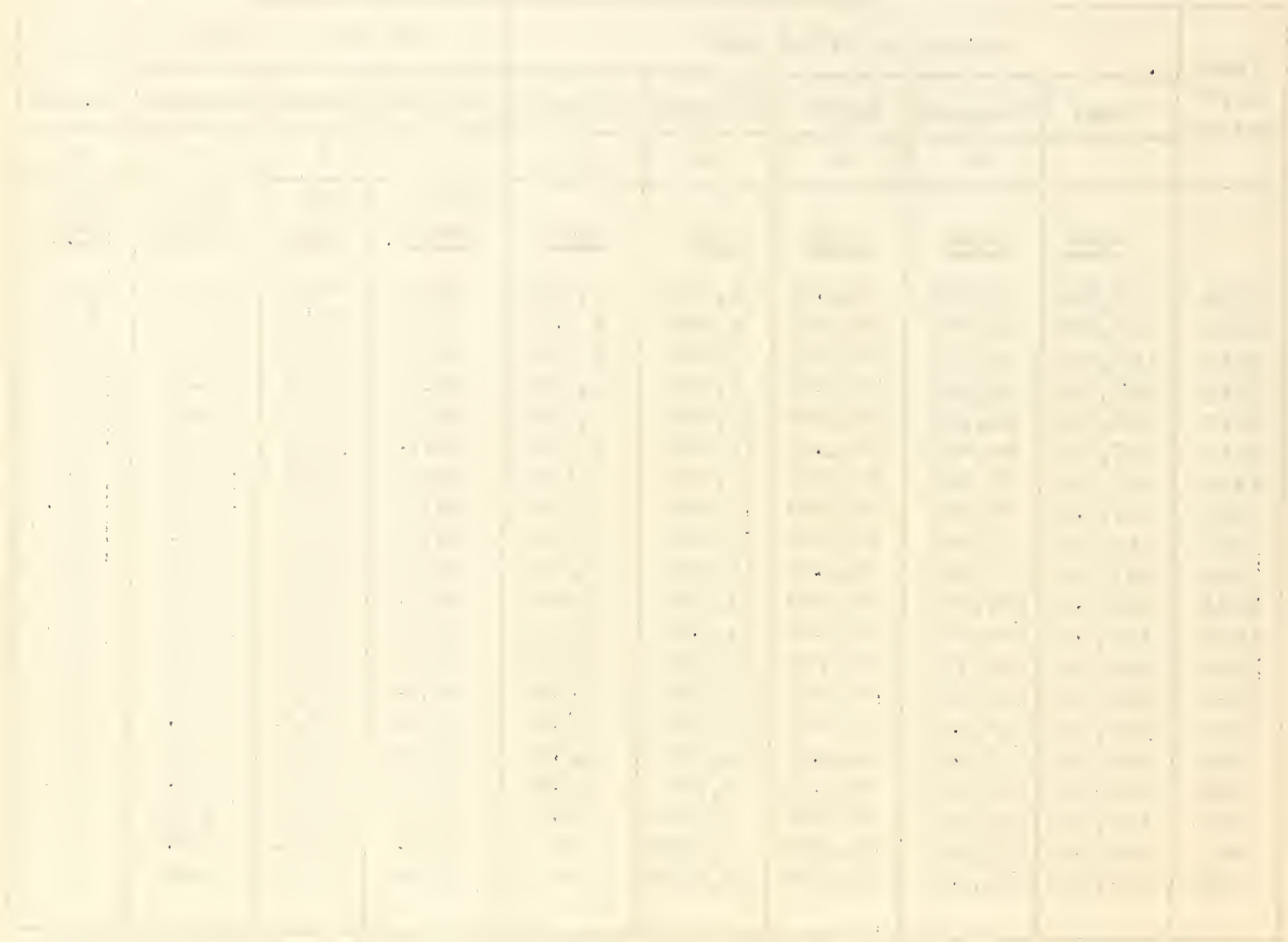


Table 5

Raisin and Currant Production of Chief Countries, Average 1909-1913, Annual 1920-1932
(In thousands of short tons)

Year harvested	Totals				Raisins						Currants	
	Raisins and currants	Currants	Raisins		California	Spain	Australia	Smyrna (Turkey)	Greece and Crete	Persia	Greece	Australia
			World	Foreign								
	1	2	3	4	5	6	7	8	9	10	11	12
Average 1909-13	tons 403.6	tons 178.7	tons 224.9	tons 153.2	tons 71.7	tons 21.3	tons 7.1	tons 54.8	tons 15.0	tons 55.0	tons 174.6	tons 4.1
1920	440.1	153.5	286.6	109.6	177.0	24.6	15.7	20.3	14.0	35.0	145.5	8.0
1921	392.1	137.2	254.9	109.9	145.0	12.1	9.4	37.4	16.0	35.0	129.5	7.7
1922	507.2	137.6	369.6	132.6	237.0	15.3	15.1	41.2	16.0	45.0	128.5	9.1
1923	550.3	117.8	432.5	142.5	290.0	17.3	20.9	44.3	11.0	49.0	106.0	11.8
1924	550.5	189.1	361.4	191.4	170.0	28.2	33.1	57.1	18.0	55.0	172.0	17.1
1925	533.3	180.1	353.2	153.2	200.0	33.6	28.6	32.5	18.5	40.0	167.0	13.1
1926	619.7	197.0	422.7	150.7	272.0	25.9	25.1	39.2	16.5	44.0	183.5	13.5
1927	643.4	154.5	488.9	203.9	285.0	25.8	49.0	56.0	24.6	48.5	141.5	13.0
1928	606.9	168.0	438.9	177.9	261.0	25.2	28.8	49.3	25.6	49.0	160.0	8.0
1929	574.7	164.6	410.1	195.1	215.0	20.7	59.4	56.0	22.0	37.0	143.4	21.2
1930	537.4	168.6	368.8	176.8	192.0	17.6	59.9	41.5	21.5	36.3	147.4	21.2
1931	406.1	93.1	313.0	144.0	169.0	16.2	36.8	31.0	21.5	38.5	73.7	19.4
1932*	602.4	164.1	438.3	186.3	252.0	19.5	45.8	65.0	27.0	29.0	145.0	19.1
1933												

* Data for 1932 are preliminary and subject to revision, and all of the estimates for Persia.

Sources of data:

Col. 5: from table 4 and S. W. Shear and H. F. Gould, Economic Status of the Grape Industry, Calif. Agr. Exp. Sta. Bul. 429 p. 124. 1927. Current data may be found in the reports of the California Crop Reporting Service at Sacramento.

Cols 6, 8, 9, 10 and 11: largely from best unofficial sources available. Data on production of these Mediterranean Basin countries since 1928 are from reports of the Office of U. S. Agricultural Commissioner N. I. Nielsen released currently in mimeographed form by the Federal-State Marketing Service at Sacramento.

Cols. 7 and 12: Compiled from official data which are now being transmitted by the U. S. Agricultural Commissioner in Australia and released currently by the Federal-State Marketing Service at Sacramento.

TABLE 6

Estimated Harvested* Production and Utilization of California Raisin Grapes, by Varieties, 1919-1932

Crop year	All raisin grapes			Thompson Seedless			Muscat			Sultana	Others
	Total	Dried	Marketed fresh	Total	Dried	Marketed fresh	Total	Dried	Marketed fresh	Dried	Dried
	1	2	3	4	5	6	7	8	9	10	11
	Thousands of fresh tons										
1919	750	730	20	295	288	7	380	367	13	47	28
1920	732	708	24	283	278	5	365	346	19	51	33
1921	627	580	47	299	285	14	260	227	33	51	17
1922	1,043	948	95	541	526	15	408	328	80	69	25
1923	1,290	1,160	130	725	698	27	460	357	103	87	18
1924	860	680	180	480	435	45	320	185	135	46	14
1925	1,178	800	378	721	615	106	391	119	272	52	14
1926	1,317	1,088	229	789	721	68	446	285	161	61	21
1927	1,443	1,140	303	891	814	77	477	251	226	59	16
1928	1,346	1,044	302	911	829	82	356	136	220	56	23
1929	1,098	860	238	739	637	102	306	170	136	38	15
1930	988	767	221	665	586	79	287	145	142	36†	†
1931	775	676	99	570	518	52	166	119	47	39†	†
1932‡	1,156	1,008	148	839	780	59	269	180	89	48†	†
1933											

* The California Crop Reporting Service estimated that about 38,000 tons of raisin grapes were unharvested in 1925, 60,000 tons in 1928, 319,000 tons in 1930, and 21,000 tons in 1932.

† For the years 1930-1932, data on Sultanas include small quantities of raisins other than Thompson Seedless, Muscat, or Sultana varieties.

‡ Data for 1932 are preliminary and subject to revision.

Sources of data:

Cols. 1, 2, and 3: compiled from California Crop Reports except that data for 1919 for col. 1 include 20,000 tons additional as shown in col. 3. Estimates of tonnage marketed fresh in 1919 from R. L. Nougaret.

Col. 4: Sum of items for corresponding years in cols. 5 and 6.

Col. 7: Sum of items for corresponding years in cols. 8 and 9.

Cols. 5, 8, 10, and 11: Based upon percentage raisin receipts of Sun-Maid by varieties in 1919 and 1920 and

(over)

(Sources of data, table 6 continued)

receipts by Sun-Maid and other packers 1921-1929. Data for 1930 and 1931 based upon data from the Raisin Pool and for 1932 on preliminary trade estimates.

Cols. 6 and 9: Based upon percentage of interstate raisin-grape shipments by varieties.

Table 7

California Muscat and Thompson Seedless Raisin Prices to Growers, 1909-1932

Crop year	Muscats	Thompsons	Thompson above Muscat	Crop year	Muscats	Thompsons	Thompson above Muscat
	1	2	3		1	2	3
	dollars per ton	dollars per ton	dollars per ton		dollars per ton	dollars per ton	dollars per ton
1909	33	43	10	1922	54	73	19
1910	55	60	5	1923	51	49	-2
1911	75	108	33	1924	61	62	1
1912	62	68	6	1925	84	75	-9
1913	70	79	9	1926	67	63	-4
1914	67	93	26	1927	51	57	6
1915	73	100	27	1928	43	43	0
1916	85	132	47	1929	62	68	6
1917	97	138	41	1930	49	60	11
1918	106	138	32	1931	57	69	12
1919	208	240	32	1932	18	40	20
1920	223	296	73				
1921	146	168	22				

Sources of data:

Cols. 1 and 2: True or weighted average prices paid to growers for raisins in the sweat box. They do not include returns on bleached and distillery or other converted stock, years 1909-1924. Years 1909-1912 represent price paid to growers by leading packers, except the 1912 price which also includes returns on approximately one-fourth of the 1912 crop sold by Sun-Maid in 1913 (see Sun-Maid Herald, Sept. 1916, p. 2, and Nov. 1915, p. 5, and Calif. Fruit News July 29, 1916, p. 1). Years 1913-1924 are Sun-Maid's returns to its members, years 1913-1921 from Associated Grower, Jan. 1923 p. 16, and 1922-1924 compiled from Sun-Maid business. Years 1925-1931 average returns of Sun-Maid and the chief independent packers compiled from data furnished by the Dried Fruit Association in Feb. 1933 through the cooperation of its members, except 1931 prices as given which are partially based on the Raisin Pool's first advance to growers. Data for 1932 are estimates subject to revision.

Col. 3: The amount by which the Thompson Seedless price in col. 2 exceeds the corresponding Muscat price in col. 1.

Table 8

Monthly F.O.B. California Quotations on Choice Bulk Baker Seeded Muscat and Thompson Seedless Raisins (in cents per pound)

Crop year	Average	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
	Muscats												
1925-26	7.92	6.00	6.75	9.25	9.00	8.50	8.50	8.50	8.50	8.50	8.50	6.50	6.50
1926-27	6.17	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	5.75	5.75
1927-28	4.73	5.50	5.25	5.00	5.00	5.00	5.00	4.50	4.50	4.50	4.50	4.25	3.75
1928-29	4.69	3.50	4.25	4.00	4.00	4.00	4.50	4.25	4.75	5.50	6.00	5.75	5.75
1929-30	5.02	6.00	5.75	5.25	5.00	5.00	5.00	5.00	4.75	4.75	4.75	4.50	4.50
1930-31	4.60	4.25	4.50	4.50	4.50	4.50	4.75	4.75	4.50	4.50	4.50	4.75	5.25
1931-32	4.58	5.25	5.25	4.75	5.00	5.00	4.75	4.75	4.50	4.50	4.00	3.75	3.50
1932-33		3.00	2.75	2.50	2.50	2.50	2.25	2.00	2.00				
	Thompson Seedless												
1925-26	6.45	5.63	6.25	6.50	6.50	6.50	6.75	6.75	6.50	6.75	6.75	6.50	6.00
1926-27	6.14	5.88	6.25	6.00	6.00	6.00	6.25	6.25	6.50	6.75	6.75	5.50	5.50
1927-28	4.97	5.38	5.00	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.00	4.00	3.50
1928-29	3.98	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.00	4.50	4.50	4.75	5.50
1929-30	4.56	5.50	5.25	5.00	5.00	4.75	4.50	4.25	3.75	4.25	4.25	4.00	4.25
1930-31	4.98	4.25	4.50	4.62	5.00	5.12	5.12	5.12	5.12	5.25	4.88	5.25	5.50
1931-32	5.48	5.50	5.38	5.50	5.62	6.00	5.88	5.88	5.88	5.88	5.25	5.75	3.25
1932-33		3.25	3.25	3.25	3.13	3.25	3.25	3.25	3.25				

Source of data:

Compiled from the California Fruit News from issues nearest the last day of the month indicated. Where a range in price quotations was given, the low quotation has been used. The averages are simple averages for the 12 months beginning September.

TABLE 9

Domestic and Export Shipments of California Raisins
(Estimated equivalent sweat-box weight)

Year beginning Sept. 1	Total shipments, domestic plus export			Domestic shipments (Excludes shipments to Canada)					Exports (Includes shipments to Canada)			Per cent of total shipments exported		
	All varieties	Seedless*	Muscats	All varieties	Seedless*	Muscats	Percentage Seedless*	Percentage Muscats	All varieties	Seedless*	Muscats	All varieties	Seedless*	Muscats
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	1,000 tons			1,000 tons			per cent		1,000 tons			per cent		
1921	155.0	95.0	60.0	125.2	75.2	50.0	60.1	39.9	29.8	19.8	10.0	19.2	20.8	16.7
1922	190.0	129.0	61.0	135.0	85.0	50.0	63.0	37.0	55.0	44.0	11.0	28.9	34.1	18.0
1923	195.0	130.0	65.0	149.4	93.4	56.0	62.5	37.5	45.6	36.6	9.0	23.4	28.1	13.8
1924	220.0	160.0	60.0	167.6	117.6	50.0	70.2	29.8	52.4	42.4	10.0	23.8	26.5	16.7
1925	240.0	188.0	52.0	168.0	123.0	45.0	73.2	26.8	72.0	65.0	7.0	30.0	34.6	13.5
1926	245.0	187.0	58.0	162.3	114.3	48.0	70.4	29.6	82.7	72.7	10.0	33.8	38.9	17.2
1927	285.0	235.5	49.5	178.0	136.5	41.5	76.7	23.3	107.0	99.0	8.0	37.5	42.0	16.2
1928	290.0	240.0	50.0	171.0	130.0	41.0	76.0	24.0	119.0	110.0	9.0	41.0	45.8	18.0
1929	215.0	179.5	35.5	148.6	118.1	30.5	79.5	20.5	66.4	61.4	5.0	30.9	34.2	14.1
1930	215.0	179.0	36.0	148.2	118.2	30.0	79.8	20.2	66.8	60.8	6.0	31.1	34.0	16.7
1931†	180.0	152.0	28.0	119.1	95.1	24.0	79.8	20.2	60.9	56.9	4.0	33.8	37.4	14.3

* Seedless are mainly Thompsons but include all raisins other than Muscats.

† 1931 data are preliminary.

Sources of data:

Col. 1: Based on shipments by rail and intercoastal water as reported by carriers, and on direct export to foreign countries from San Francisco and Los Angeles customs districts, plus an estimate of California per capita consumption equal to that in the rest of the United States. Shipments for 1921-1928 have been checked against completed sales compiled by the Giannini Foundation from records of the Sun-Maid Raisin Growers Association and summarized sales of other raisin packers furnished by the Dried Fruit Association of California

(Sources of data continued from Table 9)

through the cooperation of its members.

Col. 2: Col. 1 minus col. 3.

Col. 3: Estimated from shipments and production adjusted for inventory at beginning and end of crop year.

Col. 4: Col. 1 minus col. 9.

Col. 5: Col. 4 minus col. 6.

Col. 6: Col. 3 minus col. 11.

Cols. 7 and 8: Cols. 5 and 6 as percentages of col. 4.

Col. 9: Compiled from U. S. Monthly Summary of Foreign Commerce. Net weight converted to approximate sweat-box basis by multiplying by 1.08.

Col. 10: Col. 9 minus col. 11.

Col. 11: Rough estimates by the authors.

Cols. 12, 13, and 14: Cols. 9, 10, and 11 as percentages of cols. 1, 2, and 3.

Table 10

United States Raisin Imports
Average 1910-1914, 1921-1925, Annual 1925-1932

Year*	Total	Spain	
		Total	Per cent of total
	tons	tons	per cent
Averages			
1910-1914	1,791	891	49.7
1921-1925	5,944	1,780	29.9
Annual			
1925	3,969	973	24.5
1926	2,558	988	38.6
1927	1,268	630	49.7
1928	1,195	643	53.8
1929	782	363	46.4
1930	917	522	56.9
1931	951	399	42.0
1932	663	438	66.1

* Data for 1910-1914 are for years beginning July 1. Other data are for calendar years.

Sources of data:

Data for all years but 1932 compiled from Foreign Commerce and Navigation of the United States. Data for 1932 compiled from monthly mimeographed statements No. 3007 of U. S. Bureau of Foreign and Domestic Commerce on Exports and Imports of Dried Fruits from and into the United States, by countries.

Table 11

Sales* of California Muscat Raisins

Year beginning September 1	Estimated sales*, sweat-box weight					Tabulated sales* net packed weight			
	Total	Seeded		Cluster and layer	Loose unseeded, feed and waste	Seeded		Cluster and layer	Loose unseeded
		Carton	Bulk			Carton	Bulk		
	1	2	3	4	5	6	7	8	9
	tons	tons	tons	tons	tons	tons	tons	tons	tons
1925	52,000	28,100	15,200	3,300	5,400	22,500	12,139	1,885	4,746
1926	58,000	32,200	14,700	3,800	7,300	25,759	11,743	2,170	5,449
1927	49,500	26,700	13,200	4,000	5,600	21,379	10,507	2,254	4,196
1928	50,000	26,200	12,200	4,600	7,000	20,924	9,798	2,618	4,026
1929	35,500	18,800	8,500	3,300	4,900	14,975	6,834	1,839	3,134
1930	36,000	20,000	7,400	2,800	5,800	15,991	5,944	1,525	4,517
1931	28,000	15,900	6,400	1,600	4,100	12,730	5,130	549	2,970
1932									

* Sales refer to the quantity of completed sales or shipments during the 12 months beginning September 1 and do not include quantities sold but not shipped by September 1.

Sources of data:

Data are based upon records of the Sun-Maid Raisin Growers Association and summarized data of the independent raisin packers (that have seeding equipment) furnished to the Giannini Foundation by the Dried Fruit Association through the cooperation of its members, February, 1933.

Col. 1: Estimated from fairly complete data on total completed Muscat sales or shipments checked against production adjusted for inventory at beginning and end of crop year.

Cols. 2 and 3: Estimated by increasing items in cols. 6 and 7 by 25 per cent to allow for shrinkage and loss of weight in processing

Cols. 4 and 5: Estimated from cols. 8 and 9 by adjusting for the difference between col. 1 and the sum of cols. 2 and 3 with rough allowance for a larger proportion of layers and clusters handled by packers without seeding equipment.

Cols. 6, 7, 8, and 9: Tabulated sales as reported by Sun-Maid and other packers with seeding equipment.

Table 12

Sales of Seedless Raisins for Domestic Consumption

(In sweat-box tons)

Crop year beginning September 1	All seedless	Thompsons			Bulk seedless
		Cartons	Bags	Cartons and bags	
	1	2	3	4	5
	tons	tons	tons	tons	tons
1925	123,000	46,200	12,900	59,100	63,900
1926	114,300	45,600	15,300	60,900	53,400
1927	136,500	46,000	22,500	68,500	68,000
1928	130,000	53,500	22,000	75,500	54,500
1929	118,100	36,300	19,500	56,800	61,300
1930	118,200	38,500	22,500	61,000	57,200
1931	95,100	30,600	15,400	46,000	49,100

Sources of data:

Col. 1: From col. 5, table 9.

Cols. 2 and 3: Tabulated sales of large packers, including Sun-Maid, in net tons increased by 10 per cent to allow for volume packed by others and for loss of weight in processing. May include some shipments to Canada. Cartons mainly 15 oz., bags of 2 and 4 pounds.

Col. 4: Sum of cols. 2 and 3.

Col. 5: Calculated by subtracting col. 4 from col. 1.

Table 13

Sales of California Muscat and of Seedless Raisins

for Domestic Consumption, 1925-1931

(In percentages of the 1928-1931 average)

Crop year beginning September 1	Muscats			Seedless				
	All Muscats	Seeded		All seedless	Thompsons			Bulk seedless
		Cartons	Bulk		Cartons	Bags	Cartons and bags	
	1	2	3	4	5	6	7	8
1925	143	139	176	107	116	64	99	115
1926	153	159	170	99	115	76	102	96
1927	132	132	153	118	116	112	115	112
1928	131	130	141	113	135	109	126	98
1929	97	93	99	102	91	97	95	110
1930	96	99	86	102	97	112	102	103
1931	76	79	74	82	77	77	77	88

Sources of data:

Col. 1: Calculated from col. 6, table 9.

Cols. 2 and 3: Calculated from cols. 6 and 7, table 10. Since exports of Muscats are small, practically no error is involved in calculating relative trend in domestic sales from total sales.

Cols. 4, 5, 6, 7, and 8: Calculated from table 12.

Table 14

California Muscat Grapes Marketed Fresh, 1925-1932

Crop year	Total marketed fresh	Fresh rail shipments out of California		Used fresh within California	Per cent of total	
					Shipped out of California	Used fresh within California
	1	2	3	4	5	6
	tons	cars	tons	tons	per cent	per cent
1925	272,000	17,500	227,500	44,500	83.6	16.4
1926	161,000	9,400	122,200	38,800	75.9	24.1
1927	226,000	14,813	192,569	33,431	85.2	14.8
1928	220,000	13,759	191,250	28,750	86.9	13.1
1929	136,000	8,336	116,704	19,296	85.8	14.2
1930	142,000	8,221	106,873	35,127	75.3	24.7
1931	47,000	2,727	35,451	11,549	75.4	24.6
1932	89,000	6,212	80,756	8,244	90.7	9.3
1933						

Sources of data:

Col. 1: From table 6, col. 9.

Col. 2: Data for years 1925 and 1926 based upon estimates of N. I. Nielsen, formerly of the California Crop Reporting Service and upon mimeographed California Grape Deals of U. S. Dept. of Agriculture. Years 1927-1932 from mimeographed annual summaries on Interstate Shipments of California Grapes compiled by W. F. Cox of the U. S. Dept. of Agriculture.

Col. 3: Data in col. 2 converted to tons. See table 15 source of data to col. 2.

Col. 4: Difference between total tonnage marketed fresh in col. 1 and interstate shipments for corresponding year in col. 3.

Table 15

Interstate Shipments and Eastern Auction and Estimated Farm Prices of California Fresh Muscats and Wine-Grape Varieties

Crop year	Muscats				Wine-grape varieties			
	Interstate shipments		Price		Interstate shipments		Price	
			Auction	Farm			Auction	Farm
	1	2	3	4	5	6	7	8
	cars	tons	dollars per ton		cars	tons	dollars per ton	
1919	1,000	12,000	120	57	8,600	103,200	168	102
1920	1,500	18,000	160	78	12,000	144,000	240	154
1921	2,700	33,750	120	42	14,000	175,000	190	108
1922	5,700	79,800	112	41	18,600	260,400	164	90
1923	8,000	104,000	86	17	20,000	260,000	141	68
1924	10,300	133,900	89	19	17,200	223,600	145	71
1925	17,500	227,500	84	15	23,800	309,400	133	60
1926	9,400	122,200	82	13	24,300	315,900	120	48
1927	14,813	192,569	82	13	29,775	387,075	115	44
1928	13,759	191,250	65	0	26,459	367,780	89	22
1929	8,336	116,704	85	19	24,813	347,382	99	32
1930	8,221	106,873	86	17	27,468	357,084	86	16
1931	2,727	35,451	94	25	15,917	206,921	90	21
1932	6,212	80,756	61	-2	17,348	225,524	70	16
1933								

Sources of data:

Cols. 1 and 5: Data for years 1919-1924 based largely upon estimates of R. L. Nougaret, formerly Viticulturist in the California State Department of Agriculture, data for 1919-1921 from his annual printed reports on the Status of the California Grape Industry for 1919-1921, and 1922-1924 from his unpublished estimates. Years 1925 and 1926 based largely upon estimates of N. I. Nielsen, formerly of the California Crop Reporting Service. Years 1927-1932 from mimeographed annual summaries on Interstate Shipments of California Grapes compiled by W. F. Cox.

Cols. 2 and 6: Data in cols. 1 and 5 respectively converted at 12 tons per car for 1919 and 1920, 12½ tons per car for 1921, 14 tons for 1922, 13 tons for 1923-1927, 13.9 tons for 1928, 14 tons for 1929, and 13 tons for 1930-1932.

Cols. 3 and 7: Eastern delivered-auction prices per package converted to price per ton at the rate of 80 packages per ton.

Cols. 4 and 8: Estimated from cols. 3 and 7 respectively by deducting approximate costs of selling, freight, refrigeration, loading, package and packing.